

## 'It's Important to Know In Time'

Member Associated Business Papers, Inc.; Audit Bureau of Circulations.

The Newspaper of the Industry

*Production Tools for Victory*  
**REFRIGERATION**



*Technical Governmental*

'Written To Be Read on Arrival'

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## Inside Dope

By George F. Taubeneck

**Lick Hitler First**  
Will Come Fast  
Deflation?  
Quick Starting  
Things to Come  
New Heater  
New Wright Cyclone  
Pacific Prospects  
Easy Cold  
Hospital Train  
Mansfield Celebrates

### Lick Hitler First

After all the hullabaloo about resumption of the manufacture of consumers durable goods next summer, it finally develops that no more than a handful of items will get the green light—and these are absolute necessities.

On top of the list is commercial refrigeration. Among the others: railroad equipment, trucks, electrical transmission equipment.

Household refrigerators, which rank higher on the list than almost anything else which individuals will want for their own use, have not had a go-ahead, despite earlier predictions.

Reason: the Army-Navy people checkmated WPB and other government "claimant agencies." Here is what the military authorities believe: that until the success of the invasion is assured, civilians should be given no opportunity to become even more complacent than they seem to be already.

They believe that after the casualty lists of the invasion have been published, the public will be sobered up plenty. And then they can permit our excess supplies of raw materials and production facilities to be funneled into the production of civilian items.

When that day comes, refrigerators will be first off the mark, followed by washing machines and, later, automobiles. But don't expect this any time soon.

### Will Come Fast

Recent surveys and quiet inquiries conducted by WPB indicate that the speed of reconversion to the production of consumer durables may be considerably greater than had originally been thought. This will vary with many plans.

But the main hurdles—what to do with government machinery, worries on contract termination policies, competitive problems ("who's going to get the green light first, and why?")—will have been cleared by the time the starter's flag drops.

### Deflation?

Government economists are no longer worrying about postwar inflation. The whole tenor of their thinking has changed on this score. Now they fear deflation. They say take-home pay will be 'way down, employment down, and production of things consumers can buy will go 'way up.

Big problem now, they say, is the encouragement of new business enterprises, and of present faltering or shaky enterprises, plus the conversion of the giant "war babies" to new types of endeavor.

Much forethought will be necessary if we are to be able to re-employ the millions of ex-service men without a disastrous time lag, these economists say.

### Quick Starting

When you're cussing your old car because it won't start in this weather, you can calm your ruffled nerves by thinking upon a war-born development.  
(Concluded on Page 13, Column 1)

## 'Go Back To Your Job'—WMC To Servicemen

### Shortage of Refrigeration Repairmen Termed Threat To National Health

WASHINGTON, D. C.—Experienced refrigeration repairmen, now working on jobs less important to the national welfare, have been requested by the War Manpower Commission to return to their former occupations, WMC announced Jan. 20.

The peacetime total of approximately 28,000 of these repairmen in domestic service has decreased about 70%, or 19,600 during the war, WMC said.

The shortage of such workers, WMC said, presents a serious threat to national health. War conditions make proper refrigeration, always necessary, vitally important, WMC declared. Refrigeration equipment, however, is impossible to replace. Old machinery must be repaired and kept in use if the nation's food supply and the people's health are to be preserved.

Local United States Employment Service offices were notified by WMC to:

1. Take action to return to the refrigeration industry workers who have left it for other employment and who are not working above the skills of the refrigeration occupations. All USES offices should encourage and actively negotiate transfers of these and such other workers with experience in refrigeration occupations from other industries.
2. Encourage part-time employment in the refrigeration industry including part-time employment of workers qualified in refrigeration occupations regularly full-time at equal or higher skills in essential industries.
3. Collaborate with the Office of Civilian Requirements to put the refrigeration industry on an equitable basis with other essential activities in providing conditions favorable to retention and recruitment of workers.
4. Certify the need for training such workers where such need exists.
5. Utilize aptitude tests in selection of trainees for the industry. A WMC program for training workers for the refrigeration industry is already in operation.

## Farm Freezer Group Asks 25,000 Unit 1944 Production

WASHINGTON, D. C.—The Farm Freezer Industry Advisory Committee has presented a program calling for the manufacture and distribution of 25,000 farm freezers in 1944, WPB announced Jan. 22.

The proposed program will go before the Requirements Committee of WPB for consideration. There are no indications at present of the eventual action to be taken.

The committee, meeting in Washington for its first session, suggested that each unit approved for production combine cold storage and freezing elements and that no more than two sizes of any freezer be manufactured by any producer. The freezers also would be limited in range from 15 to 45 cubic feet capacity.

It was further proposed that distribution of these freezers be controlled through AAA County Rationing Committees, upon criteria to be furnished by the War Food Administration.

Committee members also presented evidence which they claimed supported charges that an extensive black market existed in farm freezers. The Compliance Division of WPB promised an immediate investigation.

## Walter Daily Directs Advertising For All Bendix Appliances

SOUTH BEND, Ind.—Walter J. Daily is the new advertising director for Bendix Home Appliances, Inc. He has resigned his position with the Roy S. Durstine advertising agency in New York City, and is already on the job in South Bend.

Mr. Daily is well remembered in the industry for his work as advertising and sales promotion manager of the General Electric refrigeration department in the days when they were located at Nela Park in Cleveland.

Mr. Daily's wife, widely known as Edwina Nolan, has resigned her position as Home Service Director of General Electric's household appliance division, and will move to South Bend with her husband.

For more than eight years Mr. Daily was advertising and sales promotion manager of G-E's refrigerator department, and for four of those years he was chairman of the entire company's appliance advertising committee.

He operated, in this capacity, a sales training correspondence course which had more than 10,000 students. Perhaps the climax of his promotional career was his taking a trainload of movie stars (the "42nd Street Special") across the country at the very nadir of the depression.  
(Concluded on Page 4, Column 2)

## 'Freon' Restrictions Are Continued To Aug. 31

WASHINGTON, D. C.—Restrictions on the use of "Freon-12" refrigerant will now be continued until Aug. 31, 1944, the War Production Board announced last week.

Originally the restrictions on the use of this gas were scheduled to be lifted on March 31, 1944. However, delays in the construction and operation of the new plant of Kinetic Chemicals, Inc., the only producer, at Deep Water, and an estimated shortage in the supply of anhydrous hydrofluoric acid, which is used in the production of "Freon," make the extension of restrictions necessary, WPB said.

"In thus continuing its strict controls over 'Freon' gas, WPB is endeavoring to provide a continuously available supply for use in the new aerosol insecticide 'bombs' now being used with such outstanding effectiveness by the United States fighting men in New Britain and other mosquito-infested areas of the South Pacific," said the announcement. "Additionally, WPB has to conserve all possible stocks for use in air conditioning and refrigeration systems of naval vessels and for other essential war and production uses."

## Carbon 'Tet' Again Under Allocation

WASHINGTON, D. C.—Carbon tetrachloride, formerly under limited control, has been placed under full allocation control, WPB reported Jan. 18.

The carbon tetrachloride order (Allocation Order M-363) excludes from its restrictions those distributors who sell the chemical in quantities of a drum (700 pounds) or less per month to each customer.

Beginning Feb. 1, all other deliveries must be authorized in writing by WPB. Deliveries to customers ordering 7,000 pounds or more of carbon tetrachloride in any one month must be individually authorized. Deliveries to customers ordering between 700 and 7,000 pounds per month will be authorized on the basis of end use stated in the required customers' certificates to distributors. A lump sum will be allocated to each end use without specifying individual customers' names.

Deliveries to customers ordering 700 pounds or less will be authorized by allocating a lump sum for such small orders, without specifying the customers' names and without reference to end use.

## Meilinger In New Westinghouse Post

MANSFIELD, Ohio—George H. Meilinger, former Westinghouse refrigeration sales development manager, has been appointed manager of the company's household refrigeration department to direct postwar plans for the largest refrigerator production program in the history of the Westinghouse Electric Appliance Division, announces T. J. Newcomb, sales manager of the division.

Mr. Meilinger, who has been active in Westinghouse refrigeration engineering and sales development for five years, will take on his new duties in addition to his present job of supervising contract negotiations for the production of stabilizers and fuel tanks for bombers. He succeeds Mr. Newcomb, who was appointed division sales manager in 1942.

In 1938 Mr. Meilinger joined West-  
(Concluded on Page 4, Column 2)

## WPB Moves To Relieve Squeeze In Food Storage

### War Food Officials Told Of Expanded Facilities, Relief on Repair Parts

WASHINGTON, D. C.—More than 75% of an expansion program for increasing ice-production facilities is now completed, the War Production Board has announced following a conference between the General Refrigeration and Air Conditioning Industry Advisory Committee and WPB officials.

The occasion for the report was a conference of manufacturers and executives of the refrigeration section of WPB, called to evaluate present and future requirements for ice production, food storage and allied subjects.

Representatives of the War Food Administration and the Office of Civilian Requirements advised the committee of estimated increased demands for food storage, processing and distribution facilities. The committee assured these representatives that the industry was equipped to furnish these facilities through the conversion of normal-temperature storage space to low-temperature storage space, and by maintaining maximum efficiency of refrigeration units through production of an adequate supply of repair and replacement parts for machinery.

The necessity for providing additional cold storage facilities has developed through the increased capacity of quick-freezing plants, WFA representatives pointed out. Assurances that adequate cold storage facilities could be provided without  
(Concluded on Page 4, Column 5)

## Admiral Corp. Gets Appliance Interests Of Stewart-Warner

CHICAGO—An agreement has been entered into under which Admiral Corp. plans to acquire the refrigerator and electric range manufacturing divisions of the Stewart-Warner Corp., according to an announcement made Jan. 28 by Ross D. Siragusa, president of Admiral Corp.

Admiral Corp. in peacetime laid claim to being the world's largest manufacturer of radio-phonograph combinations with automatic record changers, and it also produced table, console, and camera type models, portables and farm receiving sets.

Provisions of the agreement stipulate that Admiral Corp. plans to acquire the tools, dies, jigs and fixtures, trade names, patents, patent rights and pending patent applications, as well as engineering developments in progress in the refrigeration and electric range manufacturing divisions of the Stewart-Warner Corp.

The facilities and assets enumerated were those utilized by the Stewart-Warner Corp. prior to the war in the manufacture of seven refrigerator models, including those merchandised under the name "Dual-Temp," a line of electric ranges merchandised under the name "Scotch-Maid," and a freezer locker known as "Eskimo Pantry" and "Sub-Temp."

According to Mr. Siragusa, all plants of Admiral Corp. now are devoted exclusively to the production of communications equipment for the armed forces. In that connection,  
(Concluded on Page 4, Column 4)



## Converted Sub-Zero Unit Cools Valve Inserts to $-120^{\circ}$ F. for 'Shrink Fit' On Dodge Motor Production Line

DETROIT—A unique conversion of a standard Deepfreeze unit to the "freezing" of steel valve inserts to shrink them so they fit into motor cylinder blocks has just been effected by Dodge Division of Chrysler Corp. and the apparatus installed on the production line at Dodge Main Plant here.

The conversion of the unit was directed by Fred Glassford, special representative of the division's vice president and general manager. Glassford also was active in the development in 1932 of the use of the dry ice system of freezing inserts.

This new method of chilling, is claimed to be the most economical devised to date—much cheaper and simpler than the use of dry ice and better than liquid air.

Chrysler moreover was the first maker of passenger cars to use hard heat-resisting alloy valve inserts (since 1932) and has never changed that policy. Since then the practice of freezing valve inserts has been adopted extensively by motor manufacturers.

This new departure is of material interest to the average motorist, inasmuch as proper use of the valve inserts obviates the necessity of costly valve grinding. The valve opens some 2,000 times a minute at high speeds and exerts a 60 pound

"hammer" blow. Consequently the cast iron seats used up to the time of the Chrysler innovation pounded down into the cylinder block of the car and made imperative the grinding of the valves about every 10,000 miles or less.

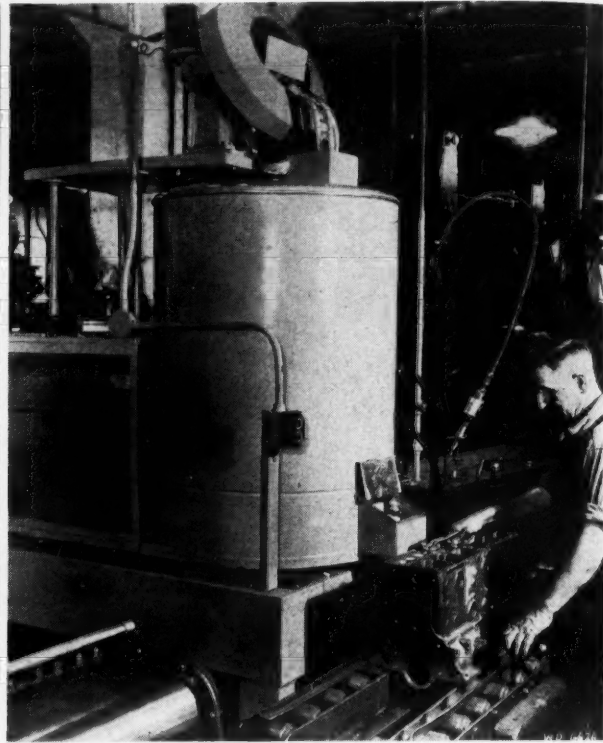
In simple, the object of the freezing is to so shrink the inserts that they will drop into the cylinder and subsequently expand as they return to normal temperature, achieving such a tight fit, or strong joint, that they cannot be pulled out without removing metal. For example, the joint is far stronger than could be achieved by pressing the part in the aperture.

In the current wartime cylinder block job, the alloy ring is about 1% inches in outside diameter by  $\frac{5}{16}$ ths of an inch thick. It is straight sided with top slanted about 45 degrees from outside to inside of ring.

The new valve insert "freezing" apparatus will permit handling of about 360 valves an hour.

The cooling gases are piped through the double inside walls of the chamber. The moisture of the air within is eliminated by a special device. The arrangement does not require opening up of the chamber for entry of the parts, and consequently an even low temperature is maintained.

## Refrigeration Extends Life of 'Motors at War'



(Left) Reduced two-thousandths by being cooled to  $-120^{\circ}$  F., this valve insert is placed in the exhaust valve hole of a cylinder block on the Dodge production line. (Right) Here is the converted freezing cabinet which cools valve inserts continuously. A revolving hopper at the top feeds the inserts through two tracks into the unit where they are cooled by the time they reach the bottom ready for insertion in the block.

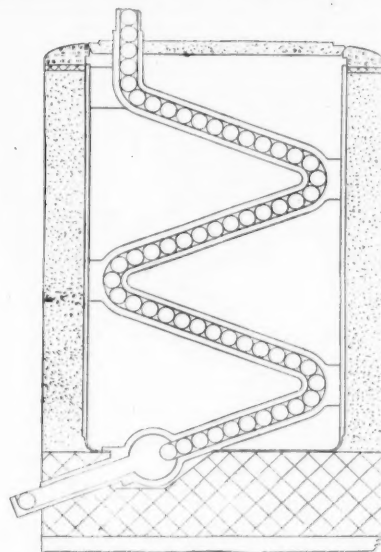
The inserts are poured—at room temperature—into a hopper just above the big cylinder of the unit. The hopper revolves under electric

control and distributes the parts downward to two-ring tracks which feed into the top of the freezing unit. The rings traverse a winding downward course through tracks to the bottom and are fed out through a special device which alternates the ejection of the inserts from either track.

The rings come through the outlet at  $120^{\circ}$  below zero, F., and are so cold they are "hot" and will "burn" the bare hand if held more than a few moments.

The inserts are thus shrunk by two thousandths of an inch and are immediately laid in the valve insert seats, six to a block in the exhaust valve holes.

The apparatus is electrically operated and controlled, with buttons to start and stop. Temperature is controlled thermostatically and a record of its temperature is visible.



This drawing shows the path of the inserts through the inner chamber of the freezing unit. Near the outlet at the bottom is a special device which feeds the inserts out from the two tracks.

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- ★ NO THREADS   ★ NO SOLDER   ★ NO FLARE   ★ NO WELD
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- ★ NO LOSS OF TIGHTNESS OF JOINT THROUGH VIBRATION
- ★ FOR HYDRAULIC, OIL, WATER, GAS, FUEL, AND AIR LINES

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## HOW SOON CAN YOU DELIVER MY REFRIGERATOR?

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**If you can't answer it NOW**

**CONSULT** Chieftain engineers for help with your postwar unit applications—no obligation, of course. So write us today!



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## C. E. Wilson Tells Refrigerator Industry Why Reconversion Date Can't Be Set

Shortage of Labor, Plus Necessity That Production Facilities Must Be Kept Flexible, Are Reasons

WASHINGTON—Date on which such important war industries as those which formerly produced domestic mechanical refrigerators and similar heavy consumer goods may resume civilian production cannot be determined now, Charles E. Wilson, executive vice chairman of the War Production Board, told members of the Domestic Mechanical Refrigerator Industry Advisory Committee at their Jan. 21 meeting.

"Our Army and Navy face what is probably the most perilous undertaking in military history," he emphasized. "Industry must be kept flexible, so that it will be able to meet the requirements for increased war production that may result from impending military operations. Until the outcome of what lies ahead becomes clear—and there is no way of telling when that will be—production of domestic mechanical refrigerators cannot be resumed."

"Materials are available, but labor cannot be assigned to turn these materials into refrigerators. Labor is already in short supply in many areas and within the next six months many men will be drafted out of industry."

Addressing the committee members in the same vein, Lemuel L. Boulware, operations vice chairman of WPB, said that resumption of

civilian production by the refrigerator industry is much farther away than has generally been supposed and that all that can be done in the interim is to explore the problems pertaining to an orderly transition from war to civilian production if and when the military situation will permit.

The transition period will be long and difficult, it was brought out in the meeting. It was estimated that the first domestic refrigerators will not come off the assembly lines until six or nine months after production is authorized.

The general problems discussed by the committee in this connection included those bearing on the minimum number of models and sizes of refrigerators that might be produced, minimum economic production runs, the expected need for new facilities to replace those now used in war production, bills of materials, critical components, such as fractional horsepower motors, automatic controls, and "Freon" refrigerant, and the matter of plant locations with relation to labor supply.

Possible solutions to most of these problems cannot be arrived at until resumption of domestic mechanical refrigerator production is in sight. All the problems require further deliberation, the committee indicated.

## No Priority Needed On Water Heaters For Replacements

WASHINGTON, D. C.—Both new and used direct and indirect fired water heaters may now be sold to consumers for replacement and maintenance purposes without ratings, WPB announced Jan. 22.

A purchaser need only certify to his dealer that such equipment is needed to replace equipment worn out, damaged beyond repair, or destroyed, and that it will not be used to replace usable equipment or to make a substitution that would provide more extensive facilities.

Provisions of Order L-185, Water Heaters, which limited sale of such equipment to orders rated A-10 or better, were revoked to bring that order into conformity with the provisions of order L-79, which was recently amended to simplify the sale and to eliminate unnecessary paperwork in connection with the sale of plumbing, heating, and cooking equipment.

Order L-185 was primarily concerned with production of water heaters. Order L-79 now controls the sale of all plumbing, heating and cooking equipment.

Order P-84, which assigned a rating of AA-5 to purchase of water heaters by consumers for replacement and maintenance purposes, was revoked Jan. 15, 1944, when L-79 was made the controlling order over sale and transfer of plumbing, heating and cooking equipment.

Sale of these heaters for other than replacement or maintenance purposes is still subject to WPB approval. Homeowners should apply for preference ratings on WPB Form 2631, while industrial and commercial users should apply on WPB Form 541.

Purchase of water heaters by sellers is now controlled by Order L-79, which assigns a rating of AA-3 to enable them to purchase and maintain an inventory of such equipment for new installations as well as for replacement purposes.

## L. H. Maxwell, Frick Sales Executive, Dies

WAYNESBORO, Pa.—Levi H. Maxwell, who was in charge of the small machines sales division of Frick Co., died Jan. 17. Mr. Maxwell had been in failing health for a year.

Born in 1882, he was engaged in engineering and sales work for some 40 years. After serving as assistant superintendent in the mills of the Carnegie and Midvale Steel companies, Mr. Maxwell came with Frick in 1923.

## Hot Plates, Small Stoves Need No Authorization

WASHINGTON, D. C.—Sale of hot plates for household use, portable ovens, air tight heaters, caboose stoves, charcoal stoves, alcohol stoves and any other items which are exceptions to the OPA's rationing of cooking appliances and heating stoves designed for domestic use, no longer requires authorization from the WPB. Previously an A-10 or better rating was required.

This change was made effective by an amendment to Order L-23-c, which formerly restricted sale of domestic cooking appliances and domestic heating stoves to orders which were either (1) rated A-10 or better or (2) covered by an OPA rationing certificate. Sales of those items rationed by OPA is still subject to rationing certificate.

Action was taken to comply with the recent removal of sales restrictions on a majority of plumbing, heating and cooking equipment from Order L-79 which controls sale and transfer of such equipment.

## Revised WPB Form 541 Is Effective Feb. 1

WASHINGTON, D. C.—Business firms and individuals who normally apply for priority assistance on WPB Form 541 (formerly PD-1A) for the acquisition of equipment or materials other than controlled materials, have been warned by the WPB that effective Feb. 1 only applications made on the new revised version of that form will be considered.

Ample supplies of the new form have been available in all WPB field offices since the first of the year. The new form may be identified by a listing of WPB field offices where in accordance with indicated instructions, these applications are now to be filed.

As of Feb. 1, all applications made out on the old form or applications filed with Washington rather than with the WPB field office nearest the person seeking priority assistance, will be returned for refile. Applicants are urged by WPB to adhere to these instructions to save their time and the unnecessary delays in final action which improper filing will entail.

## Cold Storage Plants Get AA-1 on Repairs

WASHINGTON, D. C.—Refrigerated warehouses of perishable food products have been made eligible to use the AA-1 preference rating to obtain supplies for maintenance, repair, and operation, the War Production Board has announced.

# INTO THE DAWN



## TODAY ★ ★ ★ ★ ★ ★ ★ ★

roar these giant planes with their tons of death-dealing bombs, their powerful machine guns, and their highly skilled crew. Maybe a Nazi munitions factory or a vital railway junction will be the target for today.

Delicate instruments and accurate bomb and gun sights must function perfectly if the mission is to be successful.

One way in which our armed forces keep fine instruments in adjustment and working smoothly is by keeping them in air conditioned store rooms when off duty. This keeps rust and corrosion from destroying fine watch-like balance and assures perfect operation at a moment's notice. This is but another important contribution that the refrigeration and air conditioning industry is making to Victory.

## TOMORROW ★ ★ ★ ★ ★ ★ ★ ★

This same technique of air conditioning will be applied to the protection of all types of equipment subject to deterioration in storage, delicate parts for radio, television, and other undreamed of electronic devices. Better utilization of materials with less waste will result from the manufacture and storage of myriads of products in completely air conditioned factories.

Refrigeration will play an ever-increasing part in our daily lives, contributing in countless ways to the health, comfort and well-being of the Nation.

"Detroit" Expansion Valves and Controls are doing their bit in the program for Victory on land and sea. There is a "Detroit" product which can be adapted to your needs in the fields of refrigeration of foods, air conditioning and industrial process control. Several "Detroit" refrigeration controls are also expressly made for use on our fighting ships and merchant marine. If you are in need of this type of equipment we are ready to give you every service.



## DETROIT LUBRICATOR COMPANY

General Offices: DETROIT, MICHIGAN

Division of AMERICAN Radiator and "Standard" Sanitary Corporation

Canadian Representatives—Railway and Engineering Specialties Ltd., Montreal, Toronto, Winnipeg



## With Bendix



WALTER J. DAILY

## Tay Now With Crosley Factory Sales Staff

CHICAGO — Clarence S. Tay, formerly branch manager in charge of the Chicago factory branch of The Crosley Corp., has been transferred to the main office of the company in Cincinnati, where he is now serving as automotive product manager. It is announced by J. H. Rasmussen, Crosley commercial manager.

Crosley transferred the distribution of its products in Chicago to Harry Alter & Brothers.

## Meilinger In New Westinghouse Post

(Concluded from Page 1, Column 4)

inghouse as western regional supervisor of the refrigeration department, and in 1940 he was promoted to sales development manager. He studied electrical engineering at Armour Institute of Technology, Chicago, and was a member of Delta Tau Delta fraternity. Mr. Meilinger was with General Electric Co. before he joined Westinghouse.

Postwar plans of Westinghouse outlined by Mr. Meilinger include the production of a low temperature cabinet for the storage of larger quantities of food, which will be equipped with a freezing compartment. He implied that the "immediate postwar refrigerator" will have no radical design changes.

## In a New Job



GEORGE MEILINGER

## Walter Daily Directs Bendix Advertising

(Concluded from Page 1, Column 3)

and putting on shows with this troupe at G-E distributors' showrooms enroute.

Mrs. Daily began with the Northern States Power Co. in Minneapolis, after which she was G-E's home service director for 15 years. She has served on a number of national committees, and had charge of the New England division of the WPB salvage committee.

## Serval's Profit For Year \$1,828,236

EVANSVILLE, Ind.—Net profit of \$1,828,236 before renegotiation but after Federal taxes and all other deductions has been reported by Serval, Inc. for the fiscal year ended with October. Earnings are equivalent to \$1.05 a share on the 1,726,926 shares of outstanding common stock.

In the previous year Serval netted \$1,052,846, or 61 cents a share. Net profit in the fourth quarter, after year-end adjustments, was \$753,878.

## 'Experimental' Models Can Use Aluminum

WASHINGTON, D. C.—Aluminum has been released for experimental work in the making of postwar models of refrigerators, automobiles, and other durable goods, it was announced Jan. 26 by the WPB.

The Aluminum and Magnesium Division of WPB will approve requests for small amounts of aluminum for experiments provided they can be carried out without diverting manpower, technical skills or facilities from activities connected with the war effort.

All grants of materials in application of the new policy will be carried out within the provisions of Aluminum Conservation Order M-1-i.

## Admiral Corp. Acquires S-W Appliance Interests

(Concluded from Page 1, Column 5)

Mr. Siragusa pointed out the company's production in 1943 for war purposes was approximately 100% over its peak peacetime production, and he expects his plant's facilities to increase their present war output by approximately 150% during 1944 over that of last year.

Mr. Siragusa stated that when restrictions covering the manufacture of domestic appliances are relaxed his company will be prepared to manufacture essential civilian equipment which will be merchandised under the Admiral trade name.

Mr. Siragusa also said that Admiral Corp. expects to increase its advertising appropriation to approximately \$1,000,000 a year in the promotion of Admiral products.

## New Vice Presidents Of Dayton Rubber Co.



T. C. DAVIS

Formerly manager of industrial sales for Dayton Rubber Co., recently named vice president in charge of mechanical sales planning.



T. D. SLINGSMAN

Appointed vice president in charge of mechanical sales for Dayton Rubber Co.

## Small Producers To Make Civilian Lines

WASHINGTON, D. C.—With supplies of idle and excess metals growing, the War Production Board is said to be making plans to allow small manufacturers in three WPB areas to produce limited quantities of essential civilian goods.

Surpluses of iron, steel, copper, and aluminum are increasing, and WPB is reported to be considering the proposed limited production plans as a "laboratory test" to guide the WPB when war developments permit a greater expansion in the manufacture of civilian goods.

Aluminum pots and pans, steel household goods, cooking utensils, metal venetian blinds, steel knives and forks, and similar items are the products considered for the "test." Headquarters of the three WPB areas under consideration are in Philadelphia, Cleveland, and Kansas City. States included in these areas are Virginia, Delaware, Pennsylvania, Maryland, Ohio, West Virginia, Kentucky, Nebraska, Kansas, Missouri, most of Arkansas, and part of western Iowa.

In the acute labor shortage cities (classified as Group I by the WMC) participation would be limited to plants with 10 or fewer employees. In Group II communities participating plants would be limited to 25 employees, while in other areas those employing as many as 50 could produce under the proposed plan.

The small plants would obtain leftover materials, most of which would be partly fabricated. Recently the WPB steel division estimated that there is now a surplus of 2,000,000 pounds of such idle steel and that production cut-backs will bring a greater excess.

While the armed forces have voiced objections to the plan, it is said to have the backing of WPB Chairman Donald M. Nelson, the executive vice chairman, Charles E. Wilson, and A. D. Whiteside, director of the Office of Civilian Requirements.

## Advisory Committee Reports on Moves To Halt Storage Squeeze

(Concluded from Page 1, Column 5)

resort to scheduling of production were given by members of the industry committee. To prevent shortages of components, both present and contemplated, from causing a bottleneck in this vital cold-storage facilities manufacturing program, WPB has set up a Materials Coordinating Unit to act as traffic control for the purpose of regulating the flow of materials and components to manufacturers, the WPB officials told the committee.

Planned expansion in producing facilities to increase the supply of F-12 gas, a hydrocarbon used in certain systems, is expected to be somewhat delayed in completion and may necessitate tighter controls over this gas. Concern was expressed by the committee over this situation, according to the WPB report.

Revised regulations recently placed in effect to release critical materials such as copper and aluminum will result in huge savings of manpower and time in production, according to the committee.

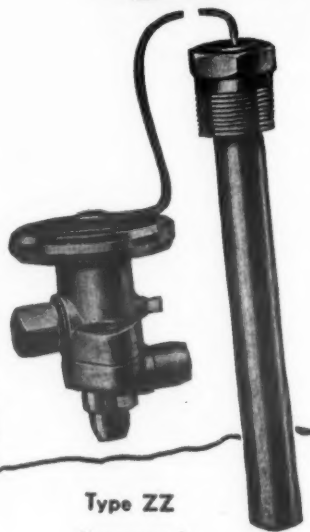
## Why Mr. Fahrenheit!

—when you placed your thermometer bulb in a mixture of salt and ice, you boldly marked the scale 0°, indicating the total absence of heat!

But now we know that  $-459^{\circ}\text{F.}$  is absolute zero and modern mechanical refrigeration has reached well into that cold zone, operating at

**$-25^{\circ}\text{F.}$  to  $-120^{\circ}\text{F.}$**

aided by the NEW  
**ALCO TYPE "ZZ"  
LOW-TEMPERATURE  
THERMOSTATIC  
EXPANSION VALVE**



Type ZZ  
Shown with  
Separable Well



Designers and Manufacturers of  
Thermostatic Expansion Valves  
Pressure Regulating Valves  
Solenoid Valves  
Float Valves

The dependability of this new Alco Valve has been thoroughly proven through careful checking of many actual field installations over an extended period of time.

Alco's new Type ZZ Valve is now available with single and multiple outlets and in capacity ranges from  $\frac{1}{2}$  to 25 tons. It is fully described in Alco Bulletin 181, containing a valve selection chart, instructions for installing, sizes of line connections, prices, etc.

Write today for this free bulletin on Alco Type ZZ Low-Temperature Thermostatic Expansion Valves.

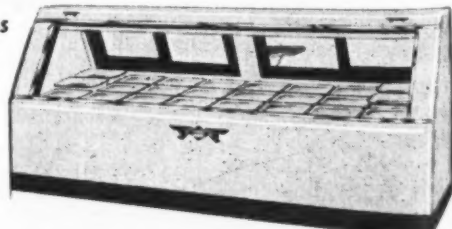
ALCO VALVE COMPANY — 855 Kingsland Avenue, St. Louis, Missouri

## SELL SHERER REFRIGERATOR EQUIPMENT

A Limited Number of Some Types

Available Without Priority  
For Immediate Shipment

Reliable source for complete line of refrigerated display equipment. Write for franchise details.



SHERER-GILLETT CO., MARSHALL, MICH.



## Plasma Freezer & Frozen Surgery Unit Help Doctors Save Many Lives



This is the newly-developed refrigeration anaesthesia machine, now being produced commercially in Chatham, Ont. E. L. Barnes (left), who helped design it, is seen with another company employee inspecting the device.



In this picture you see a machine which freezes blood plasma in a special fashion. Bottles in which processed blood is placed spin around the interior of this machine at 800 r.p.m.

## Canadian Manufacturer Starts Production of 2 New Machines On Commercial Basis for Hospitals

CHATHAM, Ont., Canada—A refrigeration anaesthesia machine, as yet unnamed and which is said to permit painless, shockless and bloodless amputation, is being produced by a Canadian firm. The maker is Chatham Malleable and Steel Products, Ltd., of Chatham, Ontario, and the device is believed the first commercially produced on the continent.

Work on the machine, which eliminates the need for other anaesthetics, was carried out under the direction of the company's chief engineer, E. L. Barnes of Chatham. The company reveals that a few of these refrigeration machines already have been sent to hospitals in New York and Philadelphia. More will be provided as material becomes available.

Noted American surgeons who have pioneered in the refrigeration process have predicted that many lives may be saved through such methods, since shock and loss of blood are two of the greatest killers in amputation. Research by Drs. F. M. Allen and L. W. Crossman of New York City hospital is said to have demonstrated that chilling of tissues, but not freezing, made it possible to amputate without pain or shock when the blood flow of the member to be amputated was shut off by use of a tourniquet.

Two other American physicians pointed out in a paper read before the Chicago Surgical Society early in 1943 that freezing damages tissues as in frostbite; but refrigeration does not. Water freezes at 32° F. while blood and tissues freeze at a slightly lower level. The machine produced by the Chatham company is kept at 38° F. for the operation.

Cracked ice or ice water has been suggested as a means of refrigerating a limb, but the paper read at the Chicago meeting said that a me-

chanical device is much more efficient since the exact degree of refrigeration may be controlled and the tissues are undamaged. It was further explained that mechanical methods are best because of cleanliness and ease of application, and more rapid refrigeration. The limb to be removed is inserted in a chamber or enclosed in an applicator where the proper degree of temperature is provided and maintained.

Plasma processing equipment also has been developed at the Chatham plant, and is the only such equipment being produced in Canada. The plant is making a unit known as the "Roto-Freezer" which freezes blood in a special fashion. The "Roto-Freezer" is equipped with multiple holders which take bottles of plasma already processed to separate red from white corpuscles. In these holders, the bottles are spun about a large washing-machine-like interior which is sealed at the top during the operation. They move at a speed of 800 revolutions per minute. This operation sets up a shell of plasma about the walls of the bottles, leaving a hollow core in the frozen plasma. A very low temperature is maintained to minimize freezing time and produce the most satisfactory texture.

Next step is for the frozen plasma to be placed into a desiccator, another appliance also being produced by the Chatham plant, where a vacuum is created and heat applied. Thus, the moisture is drawn off, being carried away by intricate devices, and this leaves a powder plasma.

Another product of the Canadian plant is a "Stato-Freezer" machine which freezes plasma in wedge-shaped blocks within bottles. Such blood is not desiccated; it is kept at a proper temperature in a refrigerated cabinet—for hospital use.

## WPB Farm Freezer Group Adds Danner Bierhaus

WASHINGTON, D. C.—Danner Bierhaus, chief engineer for the Harder Refrigerator Corp. of Cobleskill, N. Y. has been appointed a member of the newly established Farm Freezer Industry Advisory Committee to the War Production Board. The appointment was made by John C. Whitridge, Director of the Office of Industry Advisory Committees of the WPB.

The new committee which met for the first time in Washington, D. C., this month is charged with making recommendations to the War Production Board in matters of material allocation and production control. Committee members are chosen from various firms in the industry so as to represent a cross-section of that industry as to size, geographical location and products manufactured.

Mr. Bierhaus, who has been doing research work on farm and home freezers at the Harder Refrigerator Co. laboratory for some time, joins the committee with a background of years of pioneering work in this field. The first home freezer unit which was displayed at the New York World's Fair in 1939-40 was his.

## Carrier Brochure Shows Production Helps

SYRACUSE, N. Y.—Problems in eight major industries that were solved through installation of temperature and humidity control equipment are described in a brochure entitled "Problems & Solutions" issued recently by Carrier Corp. here for distribution to plant managers, plant engineers, process engineers, plant superintendents, and research laboratories.

The fields covered include steel manufacture, plastics, aviation, drug, cosmetic, dehydration, glass, and munitions industries.

For the steel industry application the brochure reports how a production "bottleneck" was broken by controlling the temperature of solution in tanks in which steel knives are quenched.

In the plastics field air conditioning equipment is used because resins are unworkable under certain atmospheric conditions, explains the bulletin.

Also illustrated and described is the installation at the huge Wright Aeronautical Corp. plant of four centrifugal refrigeration machines to cool 12,000 gallons of water a minute.



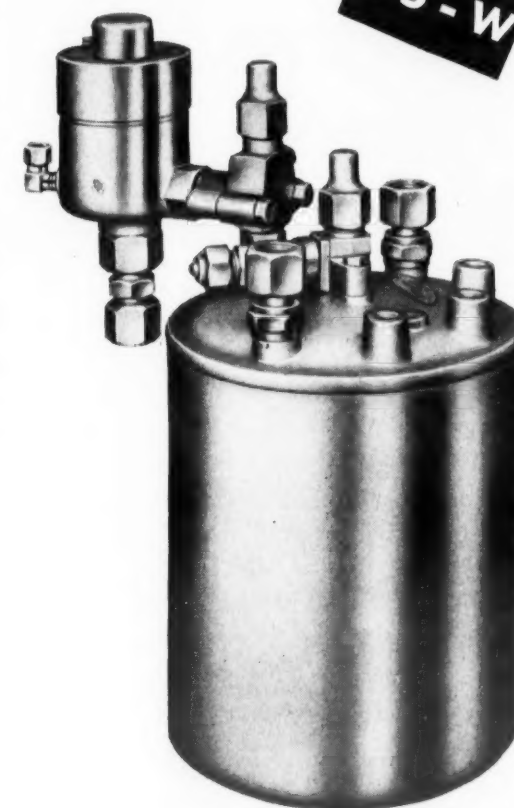
## Temprite INSTANTANEOUS LIQUID Coolers

TYPICAL EXAMPLES OF WAR INDUSTRY APPLICATIONS ARE THE COOLING OF—

- 1 **Water** for aluminum alloy quenching baths, spot welder tips, war plant cafeterias and food processing.
- 2 **Light oils** for machine tools, tool tempering baths, food processing, etc.
- 3 **Alcohol** for aluminum alloy rivet and casting quenching baths, control testing installations, etc.
- 4 **Brines** for low temperature baths for age treatment of steel, low temperature circulating systems.
- 5 **Acids and caustics** for metal treating and cleaning baths, laboratory and testing work, etc.

**TEMPRITE** coolers are famous for their high operating efficiency and accurate temperature control. These features result from the basic patented design which permits submerging the cooling coils directly in the liquid refrigerant, together with the use of the Temprite sensitive control valve.

Temprite coolers are playing an extremely important part on the Industrial War Front. New applications for improving and increasing production on important war industry operations are being found every day for Temprite coolers.



Model: 55-W medium size industrial cooler. Capacity 90 gallons per hour.

## Dealers

Temprite liquid coolers are available for dealers and distributors on authorized orders and orders direct from our armed forces. Write our sales department today for complete details.

## TEMPRITE PRODUCTS CORP.

Originators of Instantaneous



Liquid Cooling Devices

43 PIQUETTE AVENUE

DETROIT, MICHIGAN





## Army Refrigeration Problems

By P. B. Reed

Electric Refrigeration and Air Conditioning Division, Servel, Inc.

### Balancing the Units In a System

One of the most common causes of poor refrigeration is out-of-balance of the elements of the system. The unit may have too much or too little capacity compared either to the amount of heat load or the capacity of the evaporator. The evaporator may have too much or too little capacity to match either the heat load or the capacity of the condensing unit. Regardless of which is too small and which is too large, the effects are equally undesirable, although the effects are different.

#### UNDERSIZING

One of the most frequent causes of out-of-balance is undersizing, either the condensing unit or the evaporator or both, in a misguided effort to save money, but it is by no means true that this is always the case, for oversizing either the condensing unit or evaporator or both is not as uncommon as might be expected.

He who scrimps on the equipment frequently does it knowingly, but thinks that it will "get by." Sometimes "he" is a dealer who supplies undersized equipment to enable him to get under his competitor's price and make the sale.

Fortunately, dealers of this type are few and becoming fewer as time goes on. Undersizing is sometimes due to the estimator's lack of knowledge of the factors involved; he simply guesses "that it'll take about a half-horse job."

#### OVERSIZING

In order to avoid the danger of undersizing, some are inclined to use as big an evaporator as there is space for or as can be put through the cabinet door and to use the next larger size condensing unit above the size they believe would probably do the job.

The trouble with this method is that in the first place the results obtained are apt to be as undesirable as those from undersized equipment, and in the second place the customer may buy the equipment of the competitor who has calculated the job more accurately and finds that he can give the customer the results he

wants and needs with smaller equipment at a lower price; so, in such a case the competitor usually gets the job, and rightly so, for he has given the customer better service and has saved him money.

#### CALCULATE RATHER THAN GUESS

It is possible to rather accurately calculate some of the load factors especially the heat-leakage of the cabinet and usually the "product" load, which is the heat load introduced into the cabinet by putting warm food or other products into the cabinet.

By figuring these factors carefully the estimator leaves as little to chance as he can, for these are some factors of the load that he can not accurately calculate, such as how often the doors of the cabinet will be opened and how much heat will be let in thereby.

For some things he will have to draw on his experience and judgment but, as he will rarely estimate these factors exactly, the wise estimator will accurately calculate as much of the load as he can so as to leave no more than he has to to the possible

error estimation.

Those who have been most successful in estimating and selling refrigeration equipment know not only their own product—the refrigeration equipment, but also their prospect's product and what refrigeration can do and is expected to do for that product, whether the product be food, beer on draught or in bottles, milk in bulk or in bottles, water for drinking or for processing purposes, flowers, furs, aluminum sheets or rivets, steel to be "cold treated," photographic film, human blood in liquid or desiccated plasma form, airplane instruments, or any one of the dozens of uses to which refrigeration is put.

The man who knows the product he is trying to refrigerate and preserve and knows his refrigeration also, is many steps ahead of one who knows his refrigeration only. He can make a much more intelligent selection of the refrigeration equipment as to size, capacity, type and cost, and give his customer real results if he knows what he is trying to do and why. This is true of the estimator, the salesman and certainly no less true of the service man.

#### EFFECT OF THE PRODUCT TO BE REFRIGERATED ON BALANCE

The product to be refrigerated has quite a bearing on the balance in capacity between the evaporator and the condensing unit. Suppose, for example, we consider a walk-in cooler 8 feet long, 6 feet wide and 8 feet high with insulation of 3 inches of cork located in a climate with an average summer maximum of 90° F. Fresh meat delivered pre-cooled from the packing house is kept in this cooler.

After calculating the heat load it is found that an air-cooled condensing unit having a capacity of 4,000 B.t.u. per hour at 23° F. suction temperature will operate 15 hours out of the 24 in order to absorb the 60,000 B.t.u. per 24 hours estimated load.

Fresh meats require temperatures of about 38° for normal storage. They also require fairly high humidities to avoid drying out the meat. Low humidities result in loss of weight and a drying and darkening of the surface of the meat that affects its salability. The air in the refrigerator must circulate relatively slowly to avoid "burning" the surface of the meat and yet fast enough to avoid the meat becoming slimy.

To obtain proper air movement the air must be completely circulated from about 1½ to 2 times per minute. The cooler contains approximately 250 cu. ft. so the fan would have to circulate air at a rate of about 400 to 500 c.f.m.

Therefore, the blower type evaporator would have to be selected for capacity on the basis of 400 to 500 c.f.m. of air through it, so that it would have to have a larger coil than if the air could be circulated faster.

#### BOTTLED GOODS DO NOT REQUIRE HUMIDITY CONTROL

Suppose that the usage of this same cooler is to be the storage of bottled milk or beer in a quantity that will make the product load the same and that all other load factors, service, heat leakage, etc., are exactly the same as if, in the preceding paragraph, the cooler was to be used for meat storage. Assuming that the same inside temperature (38°) were to be carried, than a 4,000 B.t.u. per hour condensing unit operating 15 hours per day would be required.

But, the evaporator would be different. The same evaporator could be used, but it would be better and cheaper to use an evaporator selected for the job. The humidities in the cooler would make no difference to bottled goods so the air could be circulated at 1,000 c.f.m.

In fact, it would be desirable to use a high air velocity in order to obtain faster cooling of the bottled liquids in case of rush periods. The evaporator could, therefore, be chosen on the basis of 1,000 c.f.m. of air through it instead of 400 to 500 c.f.m. and this would call for a much smaller coil which, of course, would cost less and at the same time would actually do a better job.

#### SERVICE ENGINEERS SHOULD BE ABLE TO CHECK EQUIPMENT SELECTION

Factors of this nature should always be taken into consideration when selecting the equipment. This duty usually devolves upon the individual charged with the responsibility of selecting the equipment, whether he be an applications engineer or a salesman. The service engineer should also be familiar with these factors and be able to calculate and estimate the loads and choose the equipment at least sufficiently well to enable him to check the selection of others; for in many cases the service man can not obtain satisfactory results with an incorrectly engineered installation and it is frequently necessary for him to recommend changes in the capacity and balance of the elements of the installation.

Sometimes he can make the necessary corrections himself, such as reducing the size of the motor pulley on the condensing unit to obtain decreased capacity, thus raising the suction pressure and the evaporator temperature and thus improving the humidity conditions inside the refrigerator.

#### CAUTION

The service engineer has a responsibility not only to make or recommend changes in the installation but it goes without saying that he must be certain that he knows what changes must be made and why, and not unnecessarily disturb a well-balanced installation.



The large U-shaped bend illustrated above is a heat exchanger unit used in Army portable walk-in refrigerators with our armed forces overseas.

**MUELLER BRASS CO.**  
PORT HURON, MICHIGAN

We make:  
Standard Tubular Fittings  
Headers and Manifolds  
(Complete and semi-finished)  
Single Pipe and Double  
Pipe Copper Coils  
Special Tubular  
Assemblies  
Filters • Driers  
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We manufacture copper pipe coils in a multitude of shapes and sizes. Smooth, round bends and exact dimensions are characteristic of Mueller Brass Co. coils. Copper tubing is manufactured in our own mills—exactly the right grade as specified for the particular part. We specialize in tubular assemblies, wrought copper solder type fittings and return bends. Our equipment is the most modern procurable and adapted to low cost, high quality products. All tools for fabricating, forming and processing are made in our own Tool Making Department—the best possible tools for the job are thus obtained with the least possible delay. Write us if you have requirements for specially fabricated copper tube. Our engineers will be glad to help solve the problem.

**VALVES • FITTINGS  
ACCESSORIES FOR  
REFRIGERATION AND  
AIR CONDITIONING**

Give me a 5-letter word  
meaning dry SULFUR  
DIOXIDE and METHYL  
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5, 10, 25, 75, 100 and 150 lb. Cylinders  
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3, 6, 15, 40, 60, 90 and 130 lb. Cylinders

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Available in carload lots or handy cylinders sized for servicemen's needs.

ORDERS FILLED PROMPTLY through your Ansul Jobber.

**ANSUL CHEMICAL COMPANY**  
MARINETTE, WISCONSIN

Agents for Kinetics "FREON-12"

AC-3-44



## Two Executives of The Weatherhead Co.



**H. I. LEWIS**  
Executive vice president, the Weatherhead Co.



**HENRY F. BAILEY**  
Vice president in charge of finance, the Weatherhead Co.

## Sargeant, N.A.M. Official, Cites Factors To Retard Postwar Buying Stampede

NEW YORK CITY—The anticipated postwar civilian buying stampede was minimized by Noel Sargeant, general secretary of the National Association of Manufacturers, addressing the Association of Customer Brokers, in a statement crediting manufacturers with the foresight required to avert return of an unbalanced civilian economy.

Postwar planning now underway by more than a thousand companies will shorten the time necessary to bring about normal civilian economy, he said.

"After the war," he said, "consumers, realizing the tremendous producing capacities which have been built up, are not likely to be stampeded into buying. Many companies will bring out new products so that competition will be keen and the public will benefit from lower prices. Inflation may not be inevitable."

Mr. Sargeant believes that the postwar picture will look even more encouraging as industry and government begin to work out the handling of more details which are necessarily confusing at the present time.

## Salt Lake City Electrical Contractor Plans Dealership

SALT LAKE CITY, Utah—Kimball Vance, electrical contractor, has moved his business into a modern building at 1063 S. State St. here with the intention of establishing eventually an electrical appliance dealership.

Preoccupied now with government contracts covering Utah, Idaho, Nevada, and Colorado, Vance plans "to handle nationally advertised lines of merchandise as soon as they are available," he said.

## Refrigerators Take Second Place Again In Postwar Desires

WASHINGTON, D. C.—The Chamber of Commerce of the United States has translated into family percentages the findings in its current survey of postwar consumer buying intent, with some interesting figures indicating possible postwar buying.

Of the country's 35,000,000 families, almost two-thirds of the total, or 64%, name one or more purchases they almost certainly would make if the war were to end tomorrow—things they have found impossible or difficult to get with the war in progress.

The survey, just brought up to date, shows an ever-increasing public demand for things made scarce by wartime restrictions. It is based on samplings, through personal interviews with families making up the mass market of America—urban and rural families having incomes not in excess of \$4,000 annually. The figures obtained are described by the Chamber as not constituting predictions of actual postwar purchases, but solely as a reflection of buying intention. It is added, however, that in many instances they probably represent sharp underestimates of the consumer demand likely to appear immediately after the war.

"For example," says the Chamber "on types of purchases where the cost is nominal, many people do little or no advance planning and therefore the index of current buying intent on such items is less than the actual consumer demand that will likely develop when consumer goods are again available without restriction."

"Even on larger items, where advance planning is more of a factor, there is reason to believe that the revival of time-payment plans, and the renewal of advertising and merchandising activities will tend to stimulate additional purchases by people who are not in the market today."

"Our report indicates that not only are people planning early postwar purchases, but they are also accumulating the necessary money for these purchases. More than half of all respondents, 51% say they now have accumulated savings equal to at least a tenth of their annual income."

The survey covers particularly consumer buying intent with respect to automobiles, homes, home furnishings, home improvements and the like. Breaking down the figure of 64% who express an intention generally to buy, the tables below set up percentages of families intending to buy particular things in the fields covered by the survey.

10.5% families intend to buy automobiles.

### IN THE HOUSEHOLD APPLIANCE FIELD

7.5% families intend to buy Mechanical Refrigerators.

6.0% families intend to buy Washing Machines.

4.7% families intend to buy Stoves.

4.0% families intend to buy Vacuum Cleaners.

7.3% families intend to buy Radios.

2.4% families intend to buy Sewing Machines.

4.3% families intend to buy Electric Irons.

3.1% families intend to buy Electric Kitchen Mixers.

### IN HOME FURNISHINGS

3.9% families intend to buy Living Room Furniture.

1.9% families intend to buy Dining Room Furniture.

3.9% families intend to buy Bed Room Furniture.

4.5% families intend to buy Rugs and Carpets.

4.2% families intend to buy Linoleum.

**JOBBER**  
**ACME FLOAT VALVE SEATS**  
**Now Available, Order Quickly**

**Acme Products Co.**  
P. O. Box 1116  
San Antonio 6, Texas

## Dealers To Sell Everything and Anything To Postwar Buyers?

Discussions Have Auto Dealer Handling Refrigerators, Appliance Store Sport Goods

NEW YORK CITY—Just what are the possibilities of radical changes in the distribution of consumers' durable goods—and appliances in particular—in the postwar era?

Some of the "possibilities" came to light during the discussions at the recent marketing conference here of the American Management Association, which had as its theme "how to sell enough after the war."

Here's some of the ideas that came up:

A number of automobile dealers believe they can put their good showroom space to use in selling additional products, and have in mind particularly refrigerators and other major appliances.

At least one manufacturer of electrical equipment is giving serious consideration to owning its entire wholesale organization.

### JOINT DISTRIBUTION?

It is likely that manufacturers of non-competitive lines may develop joint distribution plans. In the appliance field this would mean that a refrigerator manufacturer would join hands with producers of stoves, cabinets, and sinks to offer a complete kitchen setup.

Producers of tires seem inclined to continue their policy of establishing

retail outlets which will sell a wide variety of items including appliances.

Some merchandisers believe that self-service—such as has been successfully applied in the sale of phonograph records—will survive the war. The customers seem to like it and costs are reduced.

The "cost" of distribution, some of the merchandisers think, will be a target, not only because some of the more radical economists think it is too high, but because wages and hence production costs will remain at higher levels after the war, and reduction of distribution costs offers one way of keeping prices down.

### DEALERS IN GLASSWARE

In the opinion of some authorities more retailers will tend to offer a wider variety of products—in the manner of the tire chains—which would mean that appliance dealers might handle glassware, sporting goods, etc. Others think that such dealers would be in a position of "losing their shirts" by such a move.

Larger stores in particular hope that they can carry over the wartime policies of eliminating special services and special displays, free deliveries, etc. Others think that such services should be maintained, but that special efforts be made to make them more economical.

## Doubled Output of Appliances Postwar, Says G. W. Mason

KENOSHA, Wis.—Doubled production of refrigerators, stoves, and appliances and a substantial increase in car output is planned by Nash-Kelvinator Corp. after the war, George W. Mason, president, revealed to sales officials and press representatives here recently.

"We are going to hit the market hard," he promised. "No company can be criticized for preparing for the peace insofar as these plans do not interfere with war output. In Nash-Kelvinator, every plant has been thoroughly studied, schedules have been determined, plants diagrammed, and we know where every piece of machinery is to be located."

"Every major vendor from whom we intend to buy materials has been contacted, machine tool men have been contacted, and orders are already under way," Mr. Mason declared.

Yearly goal of 1,000,000 units has been established for the Kelvinator and Leonard divisions, while every department at Nash is to be expanded, he added.

### Kold Kist Expands Plant

LOS ANGELES—An addition to the food processing building is being erected at the plant of Kold Kist, Inc., at 5329 E. Washington Blvd., Belvedere district, Los Angeles.

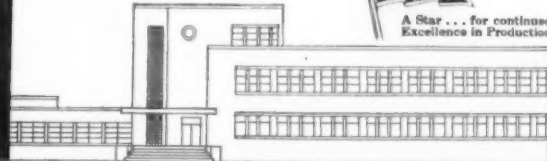
# Your Post War VALVE IS HERE TODAY!



- ★ Eliminates sticking of seats
- ★ Eliminates water hammer
- ★ Eliminates drain plug
- ★ Eliminates rusting of range spring
- ★ Eliminates need for lubrication
- ★ Eliminates corrosion of and sedimentation on sliding parts

● Never before have such outstanding features been available...because never before was there a water regulator like the Penn Series 246. It's new...it's different...it's more efficient and more dependable over a longer period for all refrigeration applications. Get all the facts on this new water regulator which will be available soon...write for Bulletin R-1986. Penn Electric Switch Co., Gosben, Ind. In Canada: Powerlite Devices, Ltd., Toronto, Ont.

# Penn



## AUTOMATIC CONTROLS

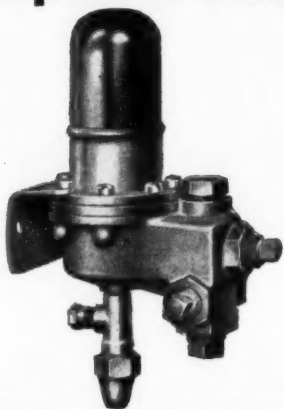
FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS



## SNAP ACTION VALVES for Multiple Temperature

Adjustable  
from 20" of  
vacuum to 63  
lbs. pressure

Proven in  
Performance



Differential  
7 lbs. minimum  
to 29 lbs. max.

Free from  
bellows strain

Here is a marvelous precision valve designed for systems with more than one coil, operated from the same compressor. Any variety of units such as ice cream cabinets, soda fountains, back bars, water coolers, candy counters, beer coils, storage rooms, etc., may be connected to a single compressor unit by the use of an Aminco Snap Action Valve.

This means more today than ever before, what with the difficulties experienced by the serviceman in satisfying his trade with "too little" material for the work to be done.

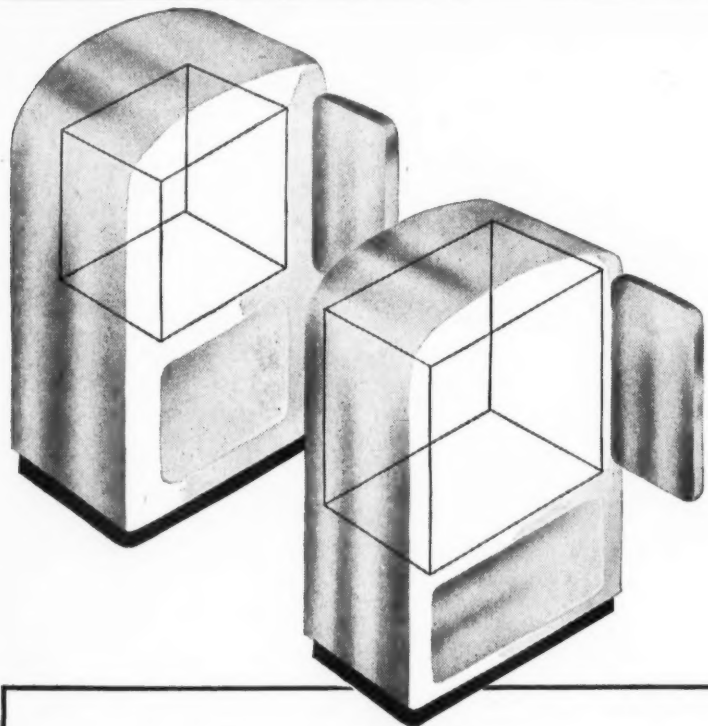
Aminco Snap Action Valves are not an experiment. They have proven their worth in years of actual service and are doubly useful under today's conditions when one piece of equipment must do the work of several.

May be used with any refrigerant except ammonia. For flooded as well as dry gas types or any combination of either.

As always, our company is definitely interested in the survival of the refrigeration industry and is doing its utmost to cooperate with established operators.

**AMERICAN INJECTOR COMPANY**  
1481 Fourteenth Avenue DETROIT, MICHIGAN

Pacific Coast: Van D. Clothier, 1015 E. 16th, Los Angeles, Calif.  
Export: Borg-Warner International Corp., 310 S. Michigan Ave., Chicago, Ill.



How to add up to  
**50% more**  
storage space to  
your postwar  
refrigerators

without increasing over-all  
size or lowering efficiency!

### Quick facts on Santocel

- Insulating value:** The thermal conductivity of Santocel (a silica aerogel) is lower than that of any other material or methods of insulation employed except a highly evacuated, silvered-surface space.
- Density:** The density of Santocel is about the same as that of other loose fill insulators. However, because of its high efficiency, weight savings are accomplished since the volume required is only half that usually employed.
- Application:** Santocel can be applied by building a retaining jacket about the object to be insulated, usually of light-weight sheet metal, and filling the intervening space. Being free flowing, it can be easily applied to such a construction.
- Settling:** Santocel settles to a stable density about as rapidly as other fill types.
- Moisture sorption:** Santocel will not pick up significant quantities of water from the air. Practical tests have also shown that, when Santocel is applied to objects substantially below room temperature, no significant amounts of water accumulate through condensation.

HERE is just one of many postwar possibilities which the development and highly successful use of Santocel in low temperature refrigeration units has opened up for the entire refrigeration industry:

With this new and amazingly efficient new heat insulator, it should be possible to cut the thickness of your postwar home refrigerator walls practically in half... thus adding as much as 3.0 cubic feet of storage space to a 6.5 cubic foot unit... without lowering efficiency... and without increasing the exterior dimensions!

These remarkable savings in space are possible because Santocel has a lower heat conductivity than any other porous insulation known—even lower, in fact, than the ideal of "still" air.

A new form of silica known technically as silica aerogel, Santocel owes its unprecedented insulating efficiency to its unique cellular structure. Actually it is 90% air, trapped in spaces about one-millionth of an inch in diameter by walls one ten-millionth of an inch thick. As a result, the molecules of air may travel with the same rapidity as in "free air," but the distance they travel between collisions is substantially shortened—with substantial reductions in heat conductivity. No other insulation achieves this result.

For full details, samples and technical help in applying Santocel to your particular war or postwar heat insulating problems, inquire: MONSANTO CHEMICAL COMPANY, Merimac Division, Everett Station, Boston 49, Massachusetts.

SERVING INDUSTRY... WHICH SERVES MANKIND

**MONSANTO  
CHEMICALS**

## How To Figure Out and Set Up the New Higher Rates for Appliance Repairs

WASHINGTON, D. C. — Explanation of how to figure out and set up the new rates authorized for appliance repairs in Supplementary Service Regulation No. 22 to Maximum Price Regulation No. 165, issued Dec. 27 (published in the Jan. 3 issue of AIR CONDITIONING & REFRIGERATION NEWS) are given in OPA Service Trades Bulletin No. 9.

Bulletin No. 9 offers the following advice:

To help maintain an adequate supply of the repair services listed below, the Office of Price Administration has issued a new Regulation which will permit some establishments to raise their prices for these services.

This action was taken through issuance of Supplementary Service Regulation No. 22 to Maximum Price Regulation No. 165 as Amended—Services, and is effective Dec. 27, 1943.

### REPAIR SERVICE COVERED

The new regulation covers all maintenance work and repair of small or portable mechanical, electrical, or gas appliances commonly used in homes, hospitals, hotels, institutions, offices, retail establishments, or schools.

These include such articles as electric fans, lamps, refrigerators and refrigerating equipment (up to 25 hp.), water coolers, air conditioners (up to 25 tons capacity), sewing machines, vacuum cleaners, washing

or ironing machines, kitchen equipment, radios and phonographs (not primarily designed for commercial, military, or police use), stoves, and the like.

The Supplementary Regulation does not cover work performed upon gas unit heaters, furnaces, industrial equipment, oil burners, typewriters, adding machines, dictating machines, duplicating equipment or other office machines.

### NEW CEILINGS FOR SHOPS WITH PAID HELP

If you have at least one employee doing repair work covered by the new regulation, and if you used a customer's hourly rate to figure your price for service in March 1942, you may use as your ceiling rate the highest of the following:

1. Your highest actual customer's hourly rate in March 1942. (Paragraph a.1. of the regulation).
2. The average basic hourly wage rate you paid on Oct. 3, 1942, multiplied by two. (Paragraph a.2. of the Regulation).
3. Your Oct. 3, 1942, average basic hourly wage rate plus 60 cents. (Paragraph a.3. of the regulation).

The tables list some easy steps for figuring your new ceilings. You are not required to use this form, but it will help you to do so. You will find it helpful to use this table in cases where you may have to justify your prices.

If you supply more than one service at different rates, you must figure separate ceilings for each service. In that case you will find it convenient to make extra copies of the form or get extra copies of OPA Service Trades Bulletin No. 9 from your nearest OPA District Office.

### SOME SMALL SHOPS MAY ADD PAY INCREASE

You may raise your ceiling prices to offset any increase you have in mechanics' wage rates, provided you meet the following conditions:

1. You employ not more than eight persons in your entire establishment.
2. You have been exempted from the President's Wage Stabilization Order.
3. Your wage increases do not violate any National War Labor Board orders.

If you meet those conditions, you may add to a maximum customer's hourly charge which you figure under rule 2 or rule 3, above, an amount equal to the increase in your average straight-time hourly wage rate since Oct. 3, 1942. (Paragraph a.4. of the Regulation).

If you have any doubt as to whether or not you are permitted to raise wages without National War Labor Board approval, consult the nearest office of the Wages and Hours Division of the Department of Labor.

Note: You may refigure your ceiling prices if you give future wage increases, but at least 30 days must pass between changes in price ceilings.

### NEW CEILINGS FOR OWNER-OPERATED SHOPS

If you provide household appliance repair service but do not employ mechanics to do such work, you may take as your maximum customer's hourly rate the higher of the following:

1. The highest customer's hourly rate you actually charged in March, 1942 for the same service to a purchaser of the same class. (Paragraph b.1. of the Regulation).
2. The maximum customer's hourly rate now permitted your closest competitor who does have paid employees. (Paragraph b.2. of the Regulation).

The purpose of this rule is to give equal treatment to all small repair shops, and to take care of those whose owners do all the repair work themselves.

Such shops, of course, would not use the form shown in this Bulletin for figuring ceiling prices.

**ADJUSTMENT FOR ODD CENTS**  
If the figure you calculate as your new maximum customer's hourly rate comes to an odd number of cents (if it cannot be divided evenly by five), you may adjust it upward to the nearest nickel.

### FIGURE A CEILING FOR EACH SERVICE

If you have different hourly rates for different types of service, such as commercial refrigeration repair, domestic refrigeration repair, radio repair, etc., then you must figure your new customer's hourly rate separately for each service.

### MINIMUM CHARGES BASED ON A STATED TIME

Many shops make minimum charges for certain types of jobs and for service calls.

Under Supplementary Regulation No. 22, you must not make such charges unless it was your practice to do in March, 1942. If you do have such charges, and they were not based upon a stated minimum of time, they must not be higher than those you had in effect in March, 1942, for the same class of customer.

However, if, in March, 1942, you regularly made minimum charges which were based on a stated minimum of time, you may now make a minimum charge based on the same minimum of time applied to your new hourly rate.

Example: Suppose that in March, 1942, you regularly made a minimum charge of \$1.50 for a certain radio repair job in your shop, and this charge was not based upon the hourly rate. In that case, you now can make a minimum charge up to, but not in excess of, \$1.50 for the same job.

Example: In March, 1942, you charged a minimum of one hour's time, including one-half hour's work for a house call for refrigerator repair. Suppose your customer's hourly rate for the job was \$1.60 at that time, but is now \$1.80. You may still charge a minimum of one hour's time, applying it to your present customer's rate and making your minimum charge \$1.80.

### PRICE INCREASES MUST BE POSTED

If you increase your prices in accordance with the provisions of the Supplementary Regulation you must post conspicuously in your place of business a notice in the following form:

### CEILING PRICES FOR LABOR

Service	New Hourly Rate
.....	\$.....
.....	.....

These rates are in accordance with OPA regulations.

### RECORDS YOU MUST KEEP

If you increase your prices under Supplementary Regulation No. 22, you must prepare a statement showing the following:

1. Your maximum customer's hourly rate for each type of service.
2. The name and address of every employee who was engaged on Oct. 3, 1942, in performing appliance and equipment repairs. Show the kind of service performed by each employee. Do not list clerical, supervisory and non-productive employees.
3. The hourly wage rate paid on Oct. 3, 1942, to each employee so listed.
4. If you are exempt from the President's wage stabilization order and if you add to your customer's hourly rate the increase in your average hourly wage rate since Oct. 3, 1942, you must show the hourly wage rate of each employee doing that kind of work on the date of any price increases.
5. The statement must show which paragraph of the Regulation you used in figuring a price increase. The paragraphs which may be used are a.1, a.2, a.3, a.4, b.1, and b.2.

Keep any such statement for inspection by OPA. A signed copy of the statement must be filed with your Local War Price and Rationing Board before you increase your prices.

### SALES SLIPS AND RECEIPTS

Upon request, you must furnish any customer with an invoice, sales slip, or bill for your services.

This invoice, or other evidence of the sale, must show separately your hourly rate for the service performed, the number of hours worked, and any charges made for parts and materials.

**PURO** ELECTRIC  
WATER  
COOLERS

Different models available for the various requirements of government agencies and war production plants.

**PURO FILTER CORP.**  
440 Lafayette St., New York

DRINKING WATER  
SPECIALISTS FOR 40 YEARS.





## Form for Recording Increase in Service Rate

The following form, or a copy of it, will be helpful to you in figuring your new customer's rates for appliance repair service. Moreover, you will find it convenient to keep a copy of the form as part of your records, in order to justify your new rates, if necessary. You do NOT have to file the form with OPA.

Calculation of Increase in Customer's Hourly Rate, Effective (date)

### AVERAGE BASIC HOURLY WAGE RATE ON OCT. 3, 1942

**OPERATIONS**  
(1) Total amount of straight-time wage rates (excluding overtime payments) paid to employees directly engaged in repair and maintenance work on Oct. 3, 1942.  
Item 1 \$.....

(2) Average basic hourly wage rate on Oct. 3, 1942. (Divide Item 1, above, by the number of employees.)  
Item 2 \$.....

### NEW MAXIMUM CUSTOMER'S HOURLY RATE

(3) The highest customer's hourly rate you actually charged in March, 1942.  
Item 3 \$.....

(4) Twice your average basic hourly wage rate on October 3, 1942. (Twice Item 2.)  
Item 4 \$.....

(5) The average basic hourly wage rate on Oct. 3, 1942 (Item 2) plus 60 cents.  
Item 5 \$.....

(6) New unadjusted maximum customer's hourly rate (the highest of Items 3, 4, and 5, above).  
Item 6 \$.....

(7) New maximum customer's hourly rate (Item 6 adjusted upward to the nearest nickel).  
Item 7 \$.....

### ADDITION FOR WAGE INCREASES SINCE OCT. 3, 1942

NOTE: This part (Items 8 to 13 inclusive) is for the use only by firms employing not more than eight persons in their entire organization, and whose wage increases have been exempted from the President's Wage Stabilization Order (Executive Order No. 9250) by National War Labor Board Orders, and do not violate any regulations of that Board. Firms whose wage increases must be approved by the National War Labor Board must not add wage increases since Oct. 3, 1942, to their maximum customer's hourly charges.

### CUSTOMER'S HOURLY RATE AFTER ADDITION FOR WAGE INCREASES

(8) Average basic hourly wage rate on the date when you figure your new maximum customer's rate:  
(8a) Total amount of straight-time wage rates (excluding overtime payments paid to employees directly engaged in repair and maintenance work on (date you figure new ceiling)  
Item 8a \$.....  
(8b) Average basic hourly wage rate on (date you figure new ceiling). (Divide total wage rates, Item 8a, by the number of employees.)  
Item 8b \$.....

(9) Average basic hourly wage rate on Oct. 3, 1942. (Same as Item 2.)  
Item 9 \$.....

(10) Increase in average basic hourly wage rate since Oct. 3, 1942. (Item 8b minus Item 9.)  
Item 10 \$.....

(11) Maximum customer's hourly rate on (date you figure new ceiling)  
Item 11 \$.....

(12) New unadjusted customer's hourly rate (Item 11 plus Item 10).  
Item 12 \$.....

(13) New customer's hourly rate (Item 12 adjusted upward to the nearest nickel).  
Item 13 \$.....

**ILLUSTRATIONS**  
(1) On Oct. 3, 1942, you had three employees engaged in repair and maintenance work. One man was paid a straight-time wage rate of 93 cents an hour, and the other two were paid 75 cents an hour each. The total of the three rates is \$2.43.  
(2) Divide Item 1 (in this case, \$2.43) by the number of employees (in this case, three) to obtain your average basic hourly wage rate on Oct. 3, 1942 (in this case, 81 cents).

(3) If the highest customer's hourly rate you charged in March, 1942 was \$1.50, you would enter \$1.50 in the space opposite.  
(4) Your average basic hourly wage rate on Oct. 3, 1942, as calculated in Item 2 above, was 81 cents. Multiplying 81 cents by two results in \$1.62. In this example, \$1.62 would be entered in the space opposite.

(5) Adding 60 cents to your average basic hourly wage rate (in this case 81 cents) gives a total of \$1.41. In this example, \$1.41 would be entered in the space opposite.  
(6) The highest of the three rates (\$1.50, \$1.62, and \$1.41) is \$1.62. In this case you would enter \$1.62 in the space opposite.

(7) Since your new unadjusted customer's rate (in this case \$1.62) cannot be divided evenly by five, you may round \$1.62 upward to the nearest nickel. In this case you would enter \$1.65 in the space opposite.

(8a) Suppose that you have four employees engaged in repair and maintenance work. One man is paid a straight-time wage rate of \$1.03 an hour, one man gets 90 cents an hour, and two men each get 85 cents an hour. Total of all four is \$3.63, and that is the figure you would enter in the space opposite.  
(8b) Divide the total of your present straight-time wage rates (in this case, \$3.63) by the number of your employees (in this case, four) to obtain your present average basic hourly wage rate (in this case, 91 cents).

(9) The average basic hourly wage rate on Oct. 3, 1942, in this case was 81 cents (See Item 2 above).  
(10) Subtract Item 9 (in this case, 81 cents) from Item 8b (in this case, 91 cents) to find the increase in your average basic hourly wage rate since Oct. 3, 1942 (in this case, 10 cents).

(11) Your maximum customer's hourly rate, before adding the increase in average wage rate since Oct. 3, 1942, was calculated in this example to be \$1.65 (See Item 7).  
(12) Add to your maximum customer's hourly rate (in this case, \$1.65) the amount of the increase in your wage rate as figured under Item 10 (in this case, 10 cents) to get your tentative new customer's hourly rate (in this case, \$1.75).

(13) Since your new unadjusted customer's rate (in this case, \$1.75) can be divided evenly by five, no adjustment is permitted. Your new maximum customer's rate, including the permitted addition for wage increases, is \$1.75.

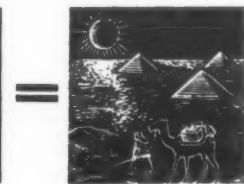
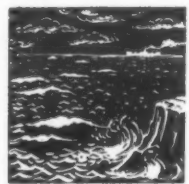
### NEW MINIMUM CHARGES BASED ON TIME

(14) Amount of increase in maximum customer's hourly rate over the previous rate for this kind of service (See Item 10). \$.....  
Description of Service, hour(s) \$.....  
Old minimum charge, hour(s) \$.....  
New minimum charge \$.....  
Item 14 \$.....

NOTE: An additional copy of this form used to calculate your new minimum charge may be filled out for each kind of service for which you increase your customer's rate under the provisions of Supplementary Regulation No. 22. It need not be filed with OPA.

(14) If you have minimum charges based upon a certain amount of time, you are permitted to increase these charges by the addition of the actual increase in your hourly rate for the amount of time involved.  
Suppose that, for a house call for refrigerator repair service, you regularly charged a minimum of one hour's time, including one-half hour's work. Suppose, too, that your old customer's hourly rate was \$1.50 and that your new rate is \$1.65. You would fill in the space opposite in this way: Amount of increase in customer's rate in this case is 15 cents. For description of service you would write "House call, refrigerator repair, including one-half hour's work. Old minimum charge, one hour, \$1.50. New minimum charge, \$1.65."

If your minimum charge has been one-half hour's time, including a quarter hour's work, you would describe the service as "House call, refrigerator repair, including a quarter hour's work. Old minimum charge, one-half hour, 75 cents. New minimum charge, 83 cents."



**T**he smart refrigeration engineer knows that our sketch-equation is another way of reminding him that moisture disappears from refrigerating systems when THAWZONE, the Moving Dehydrant, "tracks" it down and destroys it, leaving the unit as "dry" as the proverbial desert.

That's why he is using more of it each succeeding year.

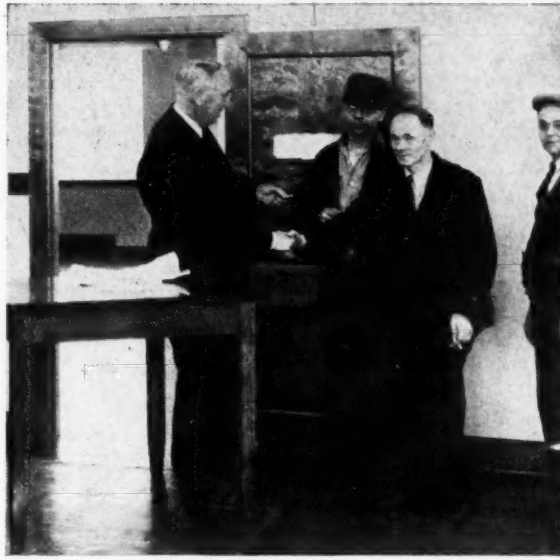
He also knows that smart jobbers are never without THAWZONE in the three well-known sizes.

**HIGHSIDE CHEMICALS CO.**  
195 VERONA AVE. - NEWARK 4, N. J.



**THAWZONE**  
Fully Protected by U. S. Patent  
The PIONEER FLUID DEHYDRANT

## Workers Win Attendance Awards



A. E. Petermann, president of Calumet and Hecla Consolidated Copper Co. presents gold award button for attendance record to Emerson Hensley at a ceremony held at the Wolverine Tube Division plant. The award is part of a plan which has given the Wolverine Tube plant a high record of non-absenteeism.

## 150 Wolverine Tube Workers Win Awards For 'Being on the Job'

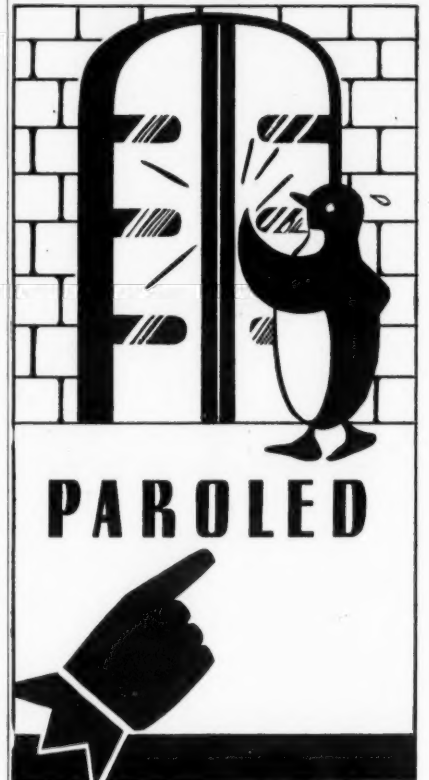
DETROIT—As part of a long term program to keep absenteeism at a minimum and production at a maximum, Wolverine Tube Division of Calumet & Hecla has offered to its employees award buttons signifying good attendance.

After two years of war, these buttons—tokens of appreciation and commendation—were given to three groups totaling some 150 men.

A. E. Petermann, president of Calumet & Hecla made the presentations personally. The handsome gold

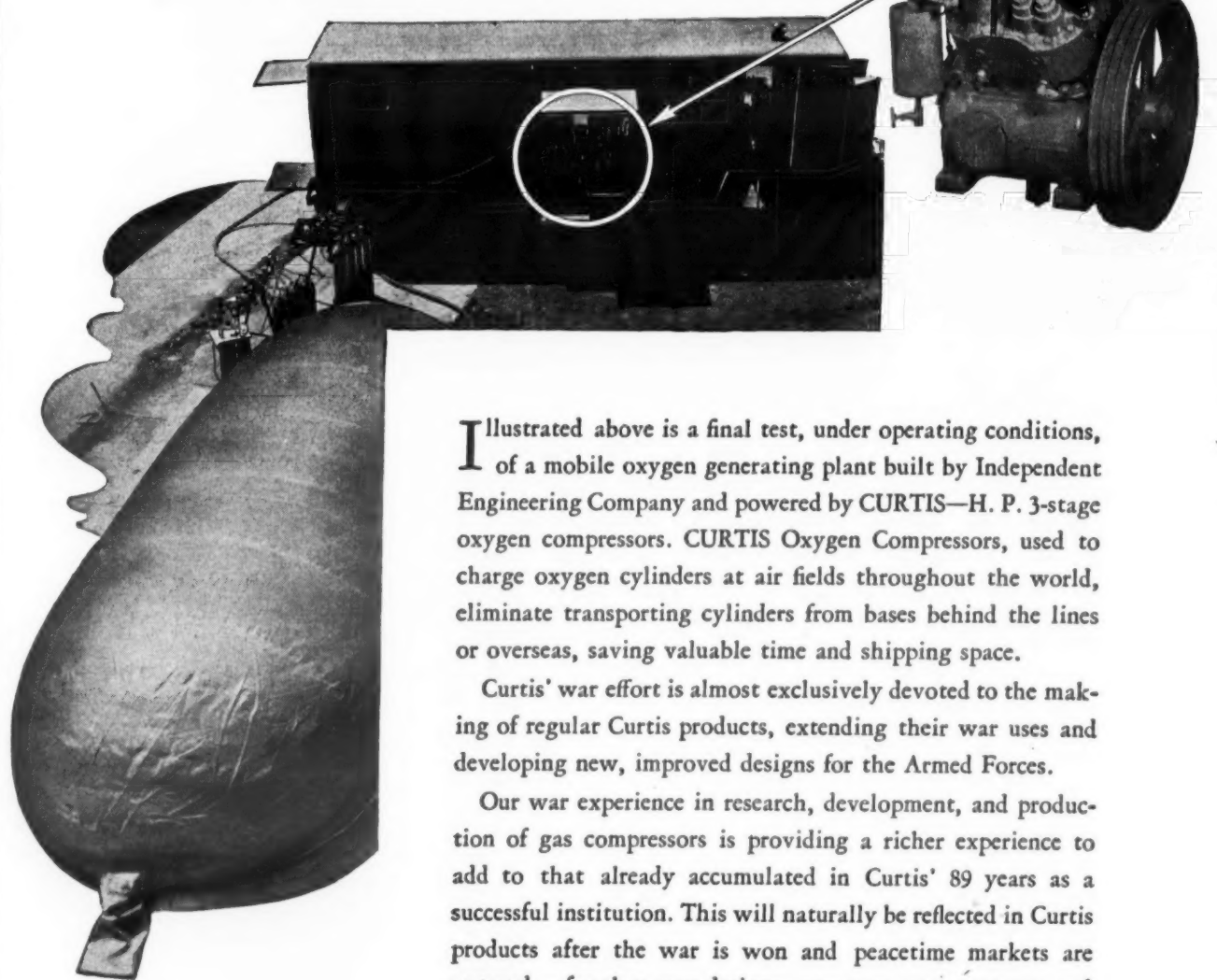
buttons carried the company trade mark on the face in colored enamel. Those employees who had shown perfect attendance for two years (since Pearl Harbor) received a black button; perfect for one year—a red one; and a green one went to those who had been absent less than five days in two years.

Another attendance abetter is a profit-sharing plan for employees that will depend on the firm's profit showing.



## CURTIS COMPRESSORS

**Now Supply Vital Oxygen at Advanced Base Air Fields Throughout the World**



**I**llustrated above is a final test, under operating conditions, of a mobile oxygen generating plant built by Independent Engineering Company and powered by CURTIS—H. P. 3-stage oxygen compressors. CURTIS Oxygen Compressors, used to charge oxygen cylinders at air fields throughout the world, eliminate transporting cylinders from bases behind the lines or overseas, saving valuable time and shipping space.

Curtis' war effort is almost exclusively devoted to the making of regular Curtis products, extending their war uses and developing new, improved designs for the Armed Forces.

Our war experience in research, development, and production of gas compressors is providing a richer experience to add to that already accumulated in Curtis' 89 years as a successful institution. This will naturally be reflected in Curtis products after the war is won and peacetime markets are restored—for then new designs, new uses, new processes and applications will be available to meet the postwar problems of our customers.



**CURTIS REFRIGERATING MACHINE DIVISION**  
of Curtis Manufacturing Company  
1912 Kienlen Avenue, St. Louis, Missouri



# Air Conditioning & REFRIGERATION NEWS

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F. M. COCKRELL, Founder

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## Need for Service Men More Acute Than Ever

ED WRIGHT over in Youngstown, Ohio, started something when he instituted a civic drive in his area to bring former refrigeration repair men back from the war plants whence they had been drawn by high pay.

Last week, in an unprecedented action, the War Manpower Commission started the same thing on a national scale. Pointing out that the peacetime total number of refrigeration repair men had decreased by 70%, the War Manpower Commission outlined five steps to recruit more men for this field. (See news story on page 1 of this issue.)

If, instead of having decreased by 70%, the number of refrigeration repair men had increased by 70%, we would be closer to handling the needs of the nation. In the current emergency, with new equipment so scarce and old equipment wearing out so rapidly—plus the addition to the load of all the new types of refrigeration equipment being used in vital production operations in war plants—the needs for refrigeration repair and maintenance talent have at least doubled during the war.

The War Manpower Commission had already gone to bat for refrigeration men by placing them on the "super-critical" list for Selective Service deferment (locking the stable after the horse was stolen), and by setting up a nationwide program for the training of new refrigeration service men. Now they come along with this push for the proselyting of former refrigeration mechanics from factories and other jobs to which they had drifted.

All these steps are vital and are appreciated. We doubt that they will be enough. When WPB Order M-28 (restricting the use of Freon-12 refrig-

They'll Do  
It Every  
Time  
By  
Jimmy  
Hatlo



erant) was extended to Aug. 31, that action automatically added thousands upon thousands of man-hours to the load which refrigeration service men must carry next spring and summer; because that may mean many conversions of Freon-12 equipment to methyl chloride. Right now almost nobody in the industry can see where the additional manpower is coming from to handle so enormous a task.

Back to Ed Wright. Some time ago Ed conceived the idea that if he could make the idea of recruiting refrigeration service men from other occupations patriotic enough, he'd have something.

So he worked up a mass meeting of civic authorities. The Congressman from that district came and spoke. The mayor, city councilmen, municipal administrators, and other bigwigs were there in support. More important, the big bosses of the factories in which these former refrigeration men are now working were also there, beaming approval. And last—but most important—these former refrigeration mechanics were also there.

In an impressive ceremony led by a War Production Board official, the WPB gave public citations to three oldtime refrigeration service men for their work in behalf of the war effort. Others, including the writer, were on the program to explain why refrigeration service work is on the highest priority list of war manpower needs today.

The result was mighty impressive. At the conclusion W. R. Kromer, who heads up the War Manpower Commission's national drive to recruit and train new refrigeration service men, explained his plan.

Similar public programs might well be instituted in other sections of the country. Since the War Manpower Commission itself is actively promoting the idea, there can be no question but that it is a highly patriotic move. As the WMC says in its bulletin:

The shortage of refrigeration mechanics "presents a serious threat to national health. War conditions make proper refrigeration, always necessary, vitally important. Refrigeration equipment, however, is impossible to replace. Old machinery must be repaired and kept in use if the nation's food supply and the people's health are to be preserved."

## LETTERS

### NO. 1 INDUSTRY

E. E. Paully & Co.  
232 N. Main St.  
Cheboygan, Mich.

Editor:

It's surprising to know that many of the people in America do not know that food is the No. 1 industry, for the reason per dollar earned and spent, based on average on above, represents more than the automobile industry and other industries, in accordance with national statistics.

The big difficulty, today, is that so many of the expert refrigeration mechanics have entered the service, which has automatically left the civilian population handicapped, more important the food distributing merchants, because of the lack of service men for same, which means much food spoilage.

Our government is seriously considering temporarily releasing thousands of refrigeration service men for their particular localities, in order to help save and preserve food, and thousands of men in the service are now taking up refrigeration service under trained government experts, of which there will be a large demand for refrigeration service men after the war.

It's entirely possible that some of our local men who are now in government service are taking up this course in refrigeration under the latest methods.

In pre-war years, refrigeration dealers and distributors of all makes of refrigeration throughout America, have made more sales than they had service men to accommodate.  
E. E. PAULLY.

### HONOLULU MAN SAYS: 'WIN THE WAR FIRST'

American Factors, Limited  
Honolulu, Hawaii, U.S.A.

Editor:

It has been some time since I wrote you last, although you are constantly being thought of in spite of my seeming neglect. I wish I could be as consistent in my correspondence as our good friend Frank Hansen, who, I note, writes from time to time, even though he is closer to the front lines than I am.

I am sure you will be interested to know that we here in Hawaii, are following with particular interest, the discussions appearing in the News, particularly those pertaining to "Post War Planning."

While "Post War Planning" is obviously necessary, I do hope that we do not lose sight of the fact we have yet to fight and win a war. I am particularly disturbed by reports I hear from friends who have been in and around some of the larger industrial centers, stating that "They don't know there's a war going on."

I am sure no one in the refrigeration industry is in any way guilty of minimizing the need for constant and unfailing production. In fact I personally think that the refrigeration industry has done exceptionally well and when the facts can be told, it will be deserving of far more credit than the general public realizes at present.

I hope to get away before long for an extended trip, and shall look forward to seeing you at which time I will be able to give you some interesting highlights on the situation in this area.

J. W. RUBENSON.

### SOLDIER APPRECIATES NEWS

Fort Bliss, Texas

Editor:

I want to compliment you on the fine work you are doing for we servicemen. We'll remember it after this is all over.

PVT. HARRY W. CUSTER

### MARINES USE OUR MANUALS

Texwood Mfg. & Sales Co.  
Greenville, S. C.

Editor:

It may interest you to know that Cpl. Wm. T. Hancock, H&S Co. Engineer Br., Camp Lejeune, New River, N. C., was one of our employees and we hope will return to us as soon as possible. He is an Instructor of Refrigeration in the Marine Corps. and has advised us that he is using your manuals. To date he has requested at least 18 or 20 of these manuals from us and feels that they are a lot of help.  
W. N. KING.

### ATTENTION, MR. KROMER:

Refrigeration Plat. 293 Q.M.  
A.P.O. No. 913, c/o Postmaster  
San Francisco, Calif.

Editor:

I read in your article of Nov. 8, 1943 of the plans being made to set up a training program for refrigeration service men, for which two types of training courses could be taken. One of six hour days for seven weeks and the other being three hours per night for 17 weeks.

I would like to know what the accomplishments have been in this setup. Also, if it is meant to go on after the war. That's the only way it could be of any good to me. This is of much interest to me and whatever information you may have will be greatly appreciated.

PFC. LOWELL EICHORN.

### HE AGREES WITH GLUFF

Shuman Bros., Inc.  
3rd and Jefferson Sts.  
Philadelphia, Pa.

Editor:

I was very much impressed with the logic and the good sense expressed by the letter of H. W. Gluff, published in your issue of Dec. 20.

There is no question in my mind at all that the industry and the dealers will not suffer one iota in business, if all the manufacturers will standardize the guarantee to a maximum of one year. It certainly would be in much better taste than this method of having a guarantee for one year and a warranty for four years, which at its best is somewhat ambiguous and always necessitates supplementary qualifications, explanations, etc.

I believe the REFRIGERATION NEWS can render a great service to the industry and the trade by intensively campaigning for this long needed and justifiable change in the form of guarantee.

Hoping that you will "go to it," I am,  
SAMUEL A. SHUMAN

### THINK THE 'NEWS' IS CONCISE, INFORMATIVE

508 St. Joe St.  
Rapid City, S. Dak.

Editor:

I truly appreciate the News as a medium of concise and informative reading.

C. F. HANKS



## Projectile Designs To Be Analyzed In High Pressure Air

ABERDEEN, Md.—A new and interesting application of centrifugal compressors has been developed for the Ballistic Research Laboratory at the Aberdeen Proving Ground, Maryland, where the huge machines will play a vital part in supersonic wind tunnels.

Heretofore the design of projectiles has been based largely on the results of actual firing on the range. The Wind Tunnel is a new instrument that will give much information on the effect of the air on the flight of projectiles. It will be of great value in the design of projectiles that have minimum resistance and hence maximum striking velocity. It will help to determine the laws that govern the flight of projectiles moving at velocities greater than the speed of sound (763 miles per hour at sea level and 70° F.), that is, at supersonic speed.

The first large supersonic wind tunnel in this country is now being built as an addition to the Ballistic Research Laboratory. In this new laboratory, air will be circulated in tunnels at high pressures, and released through nozzles to stream over the projectiles being tested.

Five compressors designed and built by Carrier Corp., will supply the air to the tunnels, from which it will flow over stationary projectiles, held in a fixed position by streamlined supports. The supports will be mounted on a balance system constructed to measure and record any forces that are imposed on it.

As the air blows past at high velocity, it exerts a violent pressure over the projectile's surface, and the reaction transmitted by the support is measured and recorded by the balance system. From these data it will be possible to design projectiles with minimum resistance. The results will be projectiles with greater velocity when striking the target, greater fire power, and greater accuracy.

The compressors which furnish the various volumes and pressures needed for circulating air in different tests, can be connected so that they will operate in series, in parallel, or in a combination of circuits to produce a wide range of pressures and volumes.

The entire circuit of the air is closed so tightly that very little leakage occurs. Before it enters the circuit the air is dehydrated to the point where only .005 grain per pound of air remains.

## Conditioning Improves Electrical Instrument Production For Army

SPRINGFIELD, Ill. — Sangamo Electric Co., here, has recently completed installation of air conditioning equipment in the space where electrical indicating instruments for the armed forces are assembled. Sangamo Electric is a subcontractor for the Weston Electrical Instrument Corp., Newark, N. J.

Purpose of the air conditioning installation, described by a Sangamo Electric official as "extremely important," is to provide air cleanliness and temperature and humidity control.

The benefits gained with air conditioning are many. Cleanliness, in the manufacture of electrical indicating instruments, is very important, and air conditioning filters the air, removing lint and small particles of dirt, which would be harmful on the inside of the instrument case.

Removal of moisture from the air prevents rust from forming on the parts made from steel, and also reduces, to a minimum on the operators' hands, perspiration, which is harmful to the instrument. An increase in operators' efficiency, due to favorable conditions of the air, has been noted.

The new equipment to provide temperature and humidity control and cleaned air comprises the second installation of Carrier equipment at the Sangamo Electric plant. In 1942, the air conditioning company provided equipment serving space in which mica capacitors are made, as well as special devices for the Navy and the Signal Corps.

## Air Cooled Wind Tunnel to Test Aircraft Engines

CLEVELAND—Intermittent operation of the National Advisory Committee for Aeronautics' huge aircraft engine wind tunnel being built here, in which temperatures and air pressures will be mechanically lowered to simulate high altitude conditions, proved the major factor in calculating the load on the tunnel's air conditioning system.

Intended for use by the committee's Aircraft Engine Research Laboratory for tests to improve the performance at high altitudes of aircraft engines and engine installations for the Army and Navy Air Forces, the tunnel will have a capacity of 500 miles per hour wind velocity, while temperatures may be

lowered to 48° F. below zero and air pressures dropped to four pounds per square inch.

The tunnel and its air conditioning system will be in actual operation only for short periods of time. Between actual running of tests there will be 24 to 48 hours devoted to removal of test setups and installation of different motors, or making changes in the test fixtures.

When the air conditioning system is inoperative the temperatures will naturally rise, but engineers hope to keep the variations within reasonable limits through extensive use of Fiberglas insulation.

Approximately 70,000 square feet of insulation are installed in the walls

of the tunnel. Metal-mesh blankets of insulation 2½ inches thick are placed between an inner steel shell ranging from one-half to fifteen-sixteenths of an inch in thickness, and the outer skin of the tunnel consisting of welded steel plates one-eighth inch thick. The Fiberglas insulation is expected to withstand vibrations of the tunnel walls during tests of engines.

Fourteen centrifugal compressors, each powered by a 1,500-hp. motor, supply refrigeration effect for the air conditioning system. These machines are housed in a nearby building, which also contains four exhaust pumps, driven by 1,750-hp. motors.

The exhaust pumps are intended to draw air from the tunnel, including exhaust-filled air, at a rate up to 6,000 pounds a minute.

Wind velocities up to 500 miles an hour will be produced by a 12-blade, laminated wood drive fan, 32 feet in diameter, powered by an 18,000-hp. motor.

Length of the tunnel is 262 feet, with the diameter ranging from 20 to 51 feet. The "throat" or testing area is 20 feet in diameter, sufficient to test aircraft engines fitted with regulation flight propellers. Although the tunnel is designed to test engines with a maximum of 3,000-hp., it is expected to prove adequate for 4,000-hp. engines.

## It's Time to Tell About Refrigeration's Hidden Services



**UNSUNG HERO**  
on the  
**HOME FRONT...**

## The Refrigeration Service Engineer

WITH many of his co-workers in the armed forces, the refrigeration service engineer is working harder than ever before, willingly taking on the great task of keeping present refrigeration in operation.

► He's one of the "unsung heroes" of the home front. His experience and knowledge of every type of refrigeration and air conditioning installation provide a firm foundation for tomorrow's progress in the industry.

► If the dependability always built into A-P Refrigerant Valves has made his task easier, we, at A-P, are grateful. And we promise continued

cooperation in the future.

WE SUPPLY: Thermostatic Expansion — Solenoid — Constant Suction Pressure — Water Regulating Valves — "Trap-Dri" System Protectors—Water Solenoids—Cooling Thermostats.

Stocked and sold by progressive refrigeration jobbers everywhere, and recommended and installed by leading refrigeration service engineers.

**AUTOMATIC PRODUCTS CO.**  
2450 North Thirty-Second Street  
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Export Department:  
15 East 40th St., New York 16, N. Y.



**DEPENDABLE**  
REFRIGERANT VALVES



## Home Freezer and Automatic Washer Win Attention at Furniture Mart

CHICAGO—Frigidaire's new home freezer and Westinghouse's completely automatic washer were the two eye-catching items among the exhibits of five major appliance manufacturers at Chicago's winter Furniture Mart this year.

Both appliances drew many questions from the record attendance of furniture dealers who thronged the exhibits. The home freezing cabinet was something entirely new, and factory representatives who were on hand to explain various details of the Frigidaire display found themselves talking about this more than any other single item.

Most of the questions dealt with the preparation of food before freezing, whether or not thawing is necessary before cooking frozen foods, the advisability of refreezing foods already cooked, and the lengths of time different foods can be stored.

But by far the most frequent question was "When can I get some of these?" The answer each time was "As soon after the war as materials are released and we get the go-ahead signal for production."

Also on display were the last pre-war models of refrigerators, ranges, and water heaters, and the company's present wartime products: Hamilton variable pitch propellers, Browning .50 caliber machine guns, and hydraulic assemblies used in the bigger bombers.

The automatic washers on display by Westinghouse performed the job of washing, rinsing, and spinning 75% of the water out of each batch of clothes put in. Two control dials allowed variation of water temperature, according to whether silk or cotton or wool was being washed, and length of time for each operation, according to whether the clothes were heavily or only slightly soiled.

Because the spin dryer was suspended in a cradle transmitting no vibration to the rest of the washer, no attachment to the floor was necessary. Only a wall outlet for electrical power, hot and cold water inlets, and an outgoing drain were required.

The Laundromat had just got started when war interrupted further development. Some 25,000 were sold before production was discontinued. The company believes the postwar market will need little selling on the appliance, and from the reaction of dealers at the mart, they are more confident than ever.

One of the self-contained moving picture units made by Mills Industries, Inc., gave a continuous performance of Charles Butterworth, the lemon-faced deadpan of the movies, doing an Elmer Blurb job of showing irate housewives how the Laundromat takes the work out of washing. Around the walls were

posters and manuals outlining Westinghouse's Conserve and Health for Victory campaigns.

General Electric's exhibit featured the bazooka anti-tank gun, manufactured for the Army. A small appliance display of electric irons, toasters, mixers, and electrically heated blankets pointed toward products that the company probably will first be able to come out with after the war.

Their display room however was fitted more as a reception center for G-E dealers, and comfortable lounging chairs were everywhere in evidence. Around the walls were some 30 of the national ads that have kept the company name before the public eye since war began.

The Norge exhibit was dominated by war material that the company

is producing: motor transmissions for invasions and tank lighters, tank-stabilizing mechanisms, the suitcase heaters used in bombers, and the 20 MM Oerlikon anti-aircraft cannon used on every craft from PT boats to airplane carriers.

Everyone coming in was handed a registration blank, and the number of these filled out and returned by Tuesday afternoon (the second day of the exhibit) had passed 1,600; and these represented about 30% of the actual number of visitors, officials at the door reported.

The Kelvinator-Leonard display was much like that of G-E, with framed full-page advertisements from national magazines featuring the company's participation in turning out airplane propellers and motors, and parts for jeeps, trucks,

tanks, and ships.

Of the three national furniture companies customarily featuring home appliances in their exhibits, only one placed any on display. The Morris S. Segal booth had new models of Thor, Meadows, and Gain-A-Day washers, and Thor Gladiron electric ironers. The other two companies however announced their intention of resuming home appliance lines after the war.

And more than one company that up to now has handled no electrical appliances at all asked questions about small manufacturers that might be looking for national distribution, and how good did the appliance business look to us, after the war.

### Frick Net For Fiscal Year \$544,425

WAYNESBORO, Pa.—Frick Co. reports for the year ending Oct. 31 net income, subject to contract renegotiation, of \$544,425, or \$6.18 a common share. Net income before taxes was \$1,842,611.

### Orders at New York Taken On 'Percentage' Basis

NEW YORK CITY—Furniture manufacturers were taking orders on a percentage basis at the New York Furniture Exchange here, and most of them are promising no furniture deliveries unless the retailer has already pre-sold the articles, it is reported here.

"Wood is scarcer than metal this year" opined one exchange official, "and it's going to be impossible to meet the entire demand for furniture."

The industry faces a serious lumber shortage, and is under War Production Board orders to slash production.

Of the furniture on display at the exchange most popular item was a kitchen sink of white vitreous china (glass) surrounded by an inlaid linoleum table top and mounted on an all-wood cabinet with drawers. If the glass sink breaks it can be replaced for less than \$10, it is claimed.

# The "BIG 5" launches the 1944

## 1 COMING YOUR WAY... IN MARCH! ANOTHER "WARTIME SERVICE COLLEGE" Featuring Repair and Care of G-E Electric Ranges and Water Heaters

Sitting-in at a General Electric Service Training School is one of the best investments any appliance service man can make. Coming your way in March is another in the series of meetings to keep you up-to-the-minute on wartime service and repair of G-E appliances.

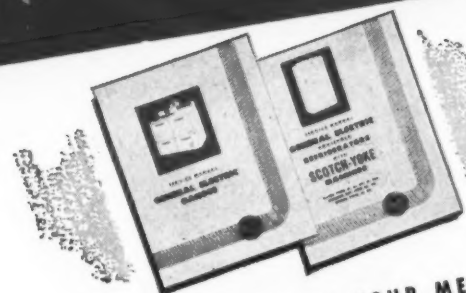
**RANGES AND WATER HEATERS FEATURED...**  
Interesting movies, slide films and demonstrations have been arranged to fill you chock-full of information about oven calibrations and adjustments, plus cooking unit repairs and tips on how to handle customer complaints. And don't forget, a complete new manual on G-E Range servicing will be ready for you.

**AND REFRIGERATORS...**  
Including introduction of the FEA sealed refrigerator unit designed to replace many of the older monitor top models.

**1944 PLANS REVEALED...**  
Including General Electric's advertising and service promotion plans for 1944. Just because General Electric isn't manufacturing electric appliances during wartime, don't think G-E is allowing the public to lose touch! You'll hear what General Electric is doing to help dealers maintain their place in the appliance limelight.

**AND THE FUTURE...**  
The future possibilities in the electric appliance industry will be discussed. Representatives of the General Electric Company will be there to talk about post-war sales potentials.

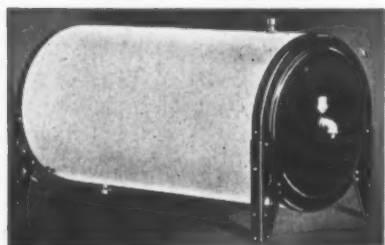
**TWO NEW SERVICE MANUALS FOR YOU...**  
One on G-E Ranges; the other on G-E Refrigerators with Scotch-Yoke machines. The finest and most complete yet compiled. Get them at the March schools!



PHONE OR SEE YOUR G-E DISTRIBUTOR FOR DATE AND LOCATION OF YOUR MEETING...

### "DAY & NIGHT"

STORAGE TYPE TANKS  
SAVE SPACE



Compact "Day & Night" Storage Units, such as the Model CE-25 shown above, may be installed any place... on walls or ceilings... or integral with condensing unit... wherever cold water is required for drinking, jacket cooling, photographic processes, cooling welding tips, etc. A modern Scuttlebutt for shipboard use. Supplied on storage capacities from 6 to 100 gallons.



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DAY & NIGHT MFG. CO.**

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FACTORY REPRESENTATIVES  
NEW YORK CHICAGO  
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R. H. Spangler, 3331 Market St. - J. E. Parker, 228 2nd St.

★  
BUY  
WAR  
BONDS  
★

Hear the General Electric radio programs: The G-E "All-Girl Orchestra" Sunday 10 p.m. — E. W. T. NBC. "The World Today" news every weekday 6:45 p.m. — E. W. T. CBS



# Inside Dope

By George F. Taubeneck

(Concluded from Page 1, Column 1)  
ment which should be available to you possibly by the winter of 1944-5.

Researchers have developed a fluid which will induce a gasoline engine to start instantaneously at 50 degrees below zero. It's applied with a spray gun.

Yes, refrigeration had a part in its development.

## Things to Come

President George Mason of Nash-Kelvinator recently made it known that he expects to build a million refrigerators in the first full year of production after the war. This would compare with half a million Kelvinator units in 1941.

If other manufacturers have simi-

larly ambitious plans it would appear that our estimate of 5,000,000 household refrigerators in 194X is decidedly conservative.

Of similar interest is the General Motors prediction that for the first three years after the war around 6,500,000 automobiles will be produced annually. This compares with a production of some 4,000,000 cars per year in the immediate pre-war years.

Among the behind-the-scenes developments to be heard from in automotive development: independent fans for cooling systems driven by electric motors; pressure cooling with liquids other than water in sealed systems; advanced automatic transmissions; some use of radar for accident prevention; chrome piston rings; aluminum castings for differential

housings and transmission cases as well as cylinder heads; improved bearings; improved lubrication systems; lower axle ratios for gasoline economy; higher compression ratios; the return of the four-cylinder engine.

## New Heater

So efficient are new heating devices for aircraft that a revolution in home heating is being predicted for the time when they can be utilized for civilian purposes.

These combustion-type heaters are exceedingly compact, unbelievably efficient, have no moving parts, burn aviation gasoline, can generate enough heat to take care of an average-size home comfortably and most economically.

Alongside this development can be placed the quiet experiments on spark-gap steam and radiant heating. Out of it all one suspects that the radiator, the coal furnace, the oil furnace, expensive ductwork, and all the cumbersome heating methods

of the past may be in for the fight of their lives.

## New Wright Cyclone

Although overshadowed in public interest by the announcement of gas-jet propulsion for aircraft, engineers will be interested in a few details of the new 18-cylinder Wright Cyclone engine.

An air-cooled radial, of course, it registers 2,200 hp. Because it has the same diameter as the 9-cylinder Cyclone plus an improved cowling, it actually creates less drag than its 550 hp. predecessor. A new steel crankcase wrests more power from the engine. Nitralloy steel cylinder barrels, aluminum cylinder head and magnesium supercharger housings all contribute to the remarkable weight-output ratio.

Incidentally, Swedish sources say that the Germans will soon have a 6,000-hp. aircraft engine in production—manufactured entirely underground (like much of Germany's aircraft production nowadays). Experts here say: "Could be."

## Pacific Prospects

One little airplane, the Grumman Hellcat (with engine supplied by Nash-Kelvinator) may have saved a year in the Pacific. The Hellcat has disproved the old dictum that naval task forces must avoid territory (land or sea) within range of Jap land-based aircraft.

Operating from the decks of our three classes of aircraft carriers (two of which are improvised) the Hellcat has proved to be far superior to any Jap plane met anywhere. With the Hellcat on decks, and the secret radio-operated anti-aircraft devices alongside, our hybrid aircraft carriers now confidently believe themselves to be more than a match for any Jap-held island in the Pacific.

## Easy Cold

Major General Thomas M. Robins, chief of the Construction Division, Corps of Engineers, tells of one post engineer at an isolated Alaskan airfield who solved the problem of an icebox in typical Paul Bunyan style.

Just outside the mess hall, he sank a shaft and drilled out a cold-storage room underground. The ladder-climbing cooks now keep their summer perishables in ground which never thaws out.

As a finishing touch, the engineer lined the underground storeroom with cakes of ice cut from a nearby lake. The ice cakes, which never melt, help maintain a constant temperature in the room of between 28 and 29 degrees.

## Hospital Train

The Army's first overseas type hospital train, built specifically for use in theaters of operations, has been exhibited to the public.

The new traveling hospital unit is of all-steel construction, and has been designated the Third Hospital Train. It consists of 10 cars, including six ward cars, a kitchen car, utilities car, and two personnel cars for officers and enlisted men. Each of the cars is slightly more than half the length of the ordinary railroad car, and was designed purposely to negotiate the sharp curves, narrow bridges and tunnels of foreign railways.

The train operates as a complete unit in itself. The utilities car furnishes electric current from two diesel generators for light, ventilation and refrigeration. Two oil-fired steam boilers provide heat and hot water. Two of the boilers or generators will operate for 14 hours without refueling. Capacity of the two fuel tanks is 150 gallons each.

Messing facilities are provided in the kitchen car, where a dining compartment will accommodate 16 members of the train's operating personnel. Patients are served from trays. Meals are prepared on a regulation Army coal-fired range.

A mechanical refrigerator of 70 cubic-foot capacity is used to preserve food. The freezing unit will turn out 1,920 ice cubes every 24 hours. One end of the kitchen car has been partitioned off for use as a pharmacy compartment, which contains all drugs and medical supplies needed on the train. This compartment is refrigerated, also.

## Mansfield Celebrates

The millionth commutator for radio equipment used in Uncle Sam's warplanes, tanks and jeeps recently rolled off the production line of Westinghouse Electric and Mfg. Co., at Mansfield, Ohio.

Consisting of 109 segments of copper, steel, plastic and mica, a commutator is the automatic timing switch of a device called a dynamotor which supplies electric current to operate military aircraft transmitters and receivers.

C. L. Van Derau, Westinghouse works manager, maintains that the job of changing from refrigerator and range production to the manufacture of commutators created many difficult problems.

For example, according to Mr. Van Derau, it took plenty of experimenting to perfect a way to make paper-thin strips of copper that are perfectly flat and which will check to dimensions that vary less than a thousandth of an inch. Mansfield engineer, Larry Bergstrom, finally solved the problem by adapting a machine formerly used to cut wire for refrigerator racks.

# GE appliance service program

2

## ANOTHER GREAT "T" PLAN HOME STUDY COURSE!

The "T" Plan on G-E Refrigerators was so enthusiastically received by more than 4000 General Electric dealers that we now announce the second step in our home study program. This new com-



plete course will feature G-E Ranges... You can get ready now by making sure you subscribe to the "PRODUCT MAN", the monthly product service magazine. Ask your G-E distributor for more details.

3

## A COMPLETE SERVICE INFORMATION LIBRARY

G-E servicing dealers have always been fortunate in having at their fingertips good printed information on the repair of G-E appliances, such as the Appliance Service Handbook... the monthly "Product Man"... and manuals. The new manuals on refrigerators and ranges help complete this reference library.



4

## G-E APPLIANCE SERVICE CENTERS To Serve You!

G-E factory-operated Appliance Service Centers have been organized to improve the flow of replacement parts to dealers, distributors, and utilities. They can help make repairs your shop is not qualified to make. They can help train manpower. They will counsel with you on any problem that has to do with parts, servicing, priorities, etc. Start 1944 by getting acquainted with the things the G-E SERVICE CENTERS can do for you!



5

## G-E PARTS AND REPLACEMENT UNITS

Thanks to the cooperation of the U.S. government and the appliance industry, the replacement parts situation for 1944 looks bright. Get the detailed story at the March meetings... and see:

1. The new FEA sealed replacement unit for Monitor Top models.
2. The new Duracast Calrod Unit for the replacement of surface units on G-E Ranges.
3. The new thermostat for older G-E irons.



BETTER CARE

LESS REPAIR

GENERAL  ELECTRIC

Cooperate with your industry in its government approved 1944 National Appliance Conservation Program. Display the slogan!



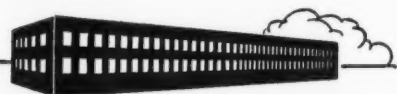


### "Have you tried AIRO?"

When men in the trade get together and someone sets up a moan about how tough it is to get this or that, it's almost a certainty that somebody will direct the "moan" to Airo. Why? Because AIRO has established a reputation for "having it." . . . If you have a particular "moan" right now, send for the newest AIRO catalog. Chances are we can fix you up, too.

#### AIRO SUPPLY CO.

2732 N. Ashland Ave., Dept C, Chicago 14, Ill.  
WHOLESALE DISTRIBUTORS  
Refrigeration Parts and Equipment



### WAR INDUSTRIES NEED REFRIGERATION

The use of refrigeration in industry has been greatly accelerated by the war. In peacetime this expansion may logically be expected to continue. Write for literature.

#### GENERAL REFRIGERATION DIVISION

Yates  
American  
Machine Co.  
Beloit, Wis.



### WATER COOLERS

for  
War Plant Cafeterias  
Army and Navy Mess Halls  
Hospitals  
Complying with Type "C", L-126,  
Dec. 28, 1943  
QUICK SHIPMENT  
Forty years of experience in building special cooling equipment.  
Send for complete catalog.  
FILTRINE MANUFACTURING CO.  
53 Lexington Ave., Brooklyn 5, N.Y.

## Army Finds Refrigerated Storage Necessary For Nutritive Diet

PHILADELPHIA — Where and how food preservation facilities become a factor in Army handling of foodstuffs was outlined by Dr. B. E. Proctor, director, subsistence and packaging research, office of the Quartermaster General, U. S. Army, in his talk at the national A.S.R.E. meeting.

The global character of this war and its high degree mobility with airplanes, tanks, and trucks, has caused us to revolutionize our thinking on Army food. Because of the long distances involved and the difficulties in transportation, from nine months to a year usually passes between the time many food items are processed and the time they are consumed by troops. This means that foods must have a long storage life because they will be stored in the cold climates of Alaska and Iceland and in the high humidity and temperatures met in the tropical climates of the South Pacific islands. Furthermore, the conditions of storage and handling leave much to be desired. In many cases food is stored with little or no cover.

With storage and handling problems as they are, the stability of many foods has become a matter of paramount importance. Some foods ordinarily considered to be stable have not proved satisfactory. For example, we have found that dried eggs deteriorate in quality when stored even for short periods at 100° F. As a result the Army now requires that the handling and storage of dried eggs in this country shall be at a temperature of 50° F. or less.

The problem of storage also has been complicated because of the necessity for the packaging of as many foods as possible in non-metal containers in order to conserve tin and steel. The whole question of packaging has been one of our most difficult problems. We have made important progress in this connection, but for some foods we still do not have ideal packages.

Beyond the problem of packaging and the problems of achieving greater stability in foods there are still other problems of greater interest. One of these is that the Army rations must contain adequate nourishment. Rations must not only be nutritious but they must also be palatable. In addition to nutritive value and palatability, an acceptable variety of foods must be provided.

For overseas troops as well as the troops in this country, menus have been carefully planned so that rations when consumed by troops will have the proper nutritional balance and have palatability and variety. It is not always possible for these menus to be followed, and any food, no matter how good, when served too frequently, becomes unwelcome.

As an example of this type of difficulty we began to receive reports

a year ago that troops tired quickly of canned meat in the Army rations. The nutritive value of canned meats is high but if they are not eaten, food is wasted and men do not receive an adequate diet. The principal difficulties with canned meats were that they consisted in large part of finely ground or small particles, and that many of the canned meat items were highly seasoned. You can well imagine that you would not enjoy the same meat in the same form three meals a day for weeks in a row, regardless of what it might be.

To remedy this, the cooperation of the meat industry was enlisted and we now have three new canned meat items—roast beef and gravy, roast pork and gravy and swiss steak. These products have a mild flavor and are made up of large chunks of meat which make them more appetizing.

In some instances, where refrigeration facilities are available, overseas troops are now receiving fresh frozen boneless beef and pork as a welcome supplement to canned meats. The addition of fresh meats gives much needed variety and increases the nutritive value of the ration. In this connection I would like to call to your attention that despite the continuing needs of the Army for large quantities of non-perishable foods, it is likely that overseas requirements for frozen foods, such as meats and poultry, will increase.

For many years the United States has been a fresh meat eating nation. We can hardly expect our soldiers to change their food habits completely and subsist entirely on processed foods for longer periods than are absolutely essential. This tendency toward fresh frozen foods will result in greater problems for the food industry and food research workers, because our present knowledge of frozen foods does not cover all of the problems now arising in their preparation and handling for overseas shipment under Army conditions.

The conservation in shipping space by the use of 50-lb. blocks of frozen beef, instead of sending carcass beef overseas, which was done in the last war, has saved about 50% of the vital space otherwise necessary. Savings of even greater magnitude have been made possible by the compression of dehydrated vegetables and other commodities which are capable of compression. Even vinegar has been debulked by removing a considerable part of its water by freezing and separation of the ice crystals by the use of centrifuges.

Many new products have made their appearance in the last year, due to the efforts of the Research and Development Branch of The Office of the Quartermaster General, and its staff of advisory experts, with the cooperation of many food industries, scientific institutions and college laboratories.

## The Priorities Quiz

(AIR CONDITIONING & REFRIGERATION NEWS, with the aid of a man who is actually engaged in handling much priorities work, will attempt to answer questions from readers about priorities problems. The editors will not guarantee to answer all questions, nor can they guarantee that the answers will be legally perfect, but an effort will be made to provide a guide to correct procedure wherever possible.)

### What Are Rules Now On Certifications?

Q. There have been a number of changes in the rules regarding the certifications on purchase orders. Can you outline for us the principal changes?

A. Priorities Regulation No. 7 has been completely revised. This regulation now provides for a standard certification which may be used in nearly all cases, the only exceptions being in the case of certain limitation orders where special certifications as to use or inventories are required, or where WPB certificate forms must accompany the order. See Priorities Regulation No. 7, Section (b).

Under these revised rules, a seller is given the option of accepting a purchase order where the certification has been omitted but where the preference rating has been shown if the seller knows the facts which the certification would show and is willing to place the certification on the order and sign it himself thus assuming full responsibility for the certification in the place of the buyer. In the event that the seller decides to assume this responsibility, he changes the wording to the certification from "undersigned purchaser" to "undersigned seller" (and wherever similar appropriate changes should be made), and signs the certification himself.

A seller may not add a CMP allotment symbol or a preference rating to the order if none is shown. In such a case, the seller must receive written notification from the buyer of both the rating and the CMP allotment symbol before they can be added to the purchase order with the appropriate certification.

In addition, if a preference rating was obtained by the buyer on a WPB-547 (PD-1X) certificate the identification "WPB-547" or "PD-1X" must be added to the purchase order. In a limited number of cases, certifications may not be made by the seller where the buyer has omitted the certification on his order. These exceptions are listed in Priorities Regulation No. 7, List B.

The revised Priorities Regulation No. 7 also provides for a "one-time certification." Some WPB orders require a certification only for the purpose of making sure that the buyer knows of the restrictions in the order. In these cases, the buyer need only certify one time to the seller. This one-time certification must be substantially as follows:

"The undersigned purchaser certifies subject to criminal penalties for misrepresentation, that he is familiar with Order . . . . . of the War Production Board, and that all purchases from you of items regulated by that order, and the use of the same by the undersigned, will be in compliance with the order, as amended from time to time."

General Preference Order P-126—the Refrigeration Repair Order—is one of the War Production Board orders for which a one-time certification may be made. In other words, by writing a letter to your supplier of refrigeration parts which you purchase under P-126 and in that letter using the form of one-time certification quoted above, you need not thereafter continue to place the P-126 certification on each order which you send that supplier. It is sufficient thereafter merely to show the preference rating and the identification "P-126."

### Regulations on Excess Material Purchases

Q. There have been so many changes recently in regulations regarding the sale of excess inventories that we find that we are confused. Can you give us a concise statement regarding the regulations now covering the purchase and sale of excess material?

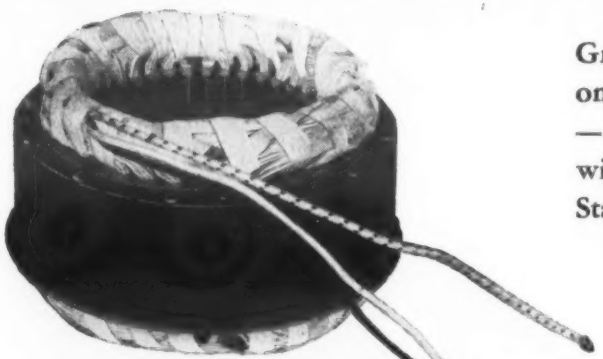
A. The many changes recently passed by WPB in the regulations covering the disposal of surplus materials is an attempt to get ready for excess inventories which will be created by government contract cancellations. It is expected that there will be considerable trade in surplus materials within the next few months. The basic rules governing the purchase and sale of this material are found in Priorities Regulation No. 13 which has been recently completely revised.

The rules are concerned principally with industrial materials—meaning raw materials and other semi-fabricated materials from which complete products are made. Primarily, any surplus inventories of industrial materials should be reported to the Redistribution Branch of the War Production Board through the Regional or local offices.

Requests for the purchase of surplus inventories should be made through the Redistribution Branch of the WPB. In this way, the WPB acts as a clearing house facilitating the movement of these surplus inventories into channels where they can be readily used. Purchasers of surplus raw materials through the WPB Redistribution Branch are not required to deduct any quantities of materials thus purchased from any allotments which may have been granted them by the WPB.

Purchasers who have been granted a CMP allotment may purchase surplus materials from other holders without necessarily going through the Redistribution Branch of the WPB but in such cases, they must deduct the amount so purchased from their allotments. A safe rule to follow whether you wish to purchase or sell surplus material is to clear through the Redistribution Branch of the WPB.

## GENUINE GRUNOW RE-WOUND STATORS ELIMINATE COMPRESSOR BURN-UPS



Grunow re-winds its statots with only the highest quality materials—specially manufactured tinned wire, purified tape, and insulation. Statots are dehydrated in Grunow specially constructed ovens and sealed airtight while hot, assuring absolute freedom from moisture.

SEND FOR NEW, CONDENSED GRUNOW SERVICE MANUAL! PRICE 50c

**Grunow**  
AUTHORIZED SERVICE, INC.

4313 W. Fullerton Avenue, Chicago, Illinois

FACTORY TESTED PARTS

ANSUL

# ICE-X

TRADE MARK

IS MAGIC

ELIMINATES MOISTURE TROUBLES...DESTROYS ICE AT EXPANSION VALVE!

FOR METHYL CHLORIDE • METHYLENE CHLORIDE AND FREON REFRIGERANT

• Literally searches out and gets rid of moisture trouble anywhere in system...destroys ice at expansion valve so no freeze-up is possible...without harm to refrigerant, oil or any of the parts of the system. Ice-X is the original, fully patented liquid dehydrant.

ORDER FROM YOUR JOBBER OR..

**THE HARRY ALTER CO.** 1728 S. MICHIGAN AVE. CHICAGO 16, ILLINOIS

JOBBERS: WRITE FOR SPECIAL PROPOSITION!






## Methods For Better Service

## Maintaining Proper Oil Level In Compressor Insures Longer Life

By A. E. Mattes, Service Manager, Universal Cooler Corp.

One of the most frequent causes for refrigeration compressor repair or replacement is the lack of proper lubrication. Now more than at any previous time due to the scarcity of manpower and materials every possible effort should be made to lengthen the life of all mechanical equipment. One of the most important factors in the life of any mechanical equipment is the maintenance of proper lubrication to all moving parts and bearings.

Low compressor oil levels in many cases date back to the time of original installation, and can be attributed to failure of the installing contractor to check back on the installation for changes in the oil level after the system has operated normally for a short period.

The importance of carefully watching oil levels immediately after installation is due to the comparatively high affinity that both methyl chloride and "Freon" have for oil. The percentage of oil that will mix with these refrigerants varies with pressure and temperature, and since some quantity of oil is taken into mixture at any temperature or pressure refrigerant entering the evaporator or lowside is not in its pure state but is actually a mixture of oil and refrigerant.

All manufacturers of refrigeration compressors have designed the compressor crank cases as large as practical so that the initial oil charge will usually be sufficient to take care of ordinary or normal installations or those which do not require the addition of refrigerant or which have lowside free from oil traps.

## WHAT HAPPENS TO OIL

All new refrigeration condensing units are charged with the specified amount of oil and the refrigerant supplied in the unit has a normal mixture of oil which has combined with the refrigerant during the run in and operating tests. The evaporator or lowside together with the lines, accessories and additional refrigerant are oil free and when the system is put in operation for the first time and the refrigerant circulates, it carries with it a percentage of the crankcase oil. A portion of this oil is deposited on the walls of the refrigerant lines and in the evaporator and does not return to the compressor.

Once in the evaporator the concentration of oil builds up to a point determined by the coil temperature, the velocity of gas and the type of evaporator. Any oil carried into the evaporator coils in excess of this concentration is returned to the compressor with the suction gas.

Each additional pound of refrigerant added to the system also mixes with a quantity of oil which does not return permanently to the compressor crankcase and particular care must be taken to watch the compressor oil level where a large quantity of refrigerant is added to that supplied with the unit.

## WHEN THE OIL IS LOW

The above conditions result in lowering the crankcase oil level and where this reduction is sufficient to drop the level below the point where the crankshaft and connecting rods will splash oil into the main bearing wells, the pistons, cylinder walls, seal, etc. sufficient lubrication will not be obtained and excessive wear will set in almost immediately.

Any looseness in these parts will quickly show up in the form of a knock and if the condition has existed for a relatively short time the addition of oil may allow the parts to run freely and the compressor to operate quietly.

If the compressor has been running for an extended period with insufficient oil the parts will undoubtedly be worn to the extent that the addition of oil will not remove the knock nor restore compressor efficiency. The addition of oil at this stage may assist in relieving the condition and prevent further damage to parts, but it will not restore the material worn away due to lack of lubrication.

It is impossible for the manufacturer to predetermine the amount of refrigerant or oil that will be required for each installation and accordingly it is imperative that some

arrangement be made to carefully check the oil level in the compressor crankcase within 24 hours after installation. It is also advisable to make an additional inspection in one week and again in 30 days on installations where it is necessary to add additional refrigerant.

## LOW TEMPERATURE APPLICATIONS

While the above recommendations should be followed on all new installations regardless of application there are conditions which can exist which prevent the proper return of oil to the compressor crankcase and even though the oil level is watched closely immediately after installation and brought up to the proper level at each inspection, can cause a continued drain of oil from the compressor.

This condition is encountered particularly on applications used for low temperature, having flooded type evaporators and those having long runs of suction line. Unless the proper oil return is assured on applications of this type a lubrication problem is certain to develop which may result in serious damage to the compressor.

Where sufficient oil is carried into the lowside to cause logging and endanger compressor operation, it is advisable to install an oil separator. Since oil and refrigerant can be separated a great deal easier while both are in a gaseous state it is advisable to install the oil separator in the discharge line as close as possible to the compressor.

Care should be taken in the selection of an oil separator to obtain one of sufficient capacity. An under-sized separator cannot remove all the oil from the volume of discharge gas it must handle and accordingly oil will continue to be carried into the lowside of the system. Oil separators are listed by most manufacturers according to type of refrigerant and maximum unit horsepower; this makes it comparatively simple to select the proper size for any application.

As an added precaution oil levels should be inspected when any service is required and it is also advisable to request the user to make known at once any usable loss of oil from any part of the system.

There are still other factors which may affect compressor oil level, however, by following the foregoing recommendations the most frequent causes of lubrication difficulties will be eliminated.

## Oil Burners Beyond Repair Replaceable Without a Rating

WASHINGTON, D. C. — Domestic type oil burners which are beyond repair or more than 10 years old may be replaced from dealers' stocks without any restrictions, according to a recent War Production Board revision of Limitation Order L-74.

All other replacements, however, require that the purchaser obtain approval from the district WPB office on Form WPB-1319.

Formerly, all installations of the Class B burner ordinarily used for heating homes had to be approved in advance by WPB's Plumbing and Heating Division in Washington. Burners which are replaced must be scrapped or dismantled, WPB has ruled.

Dealers' stocks of oil burners are also freed for new installations provided that the Petroleum Administration for War has approved in writing the delivery of fuel oil for such a burner on the premises in question.

Delivery of Class B burners from manufacturers' inventories or production of new burners of this class, however, are still subject to advance approval from WPB in Washington on Form WPB-2727.

Dealers and distributors are now given unrestricted permission to sell or deliver any Class B oil burner to another dealer or distributor.

Class A and C oil burners, which include most industrial and pot type burners, may be delivered only on orders bearing a preference rating of AA-5 or higher.

## Penn Introducing New Water Valves

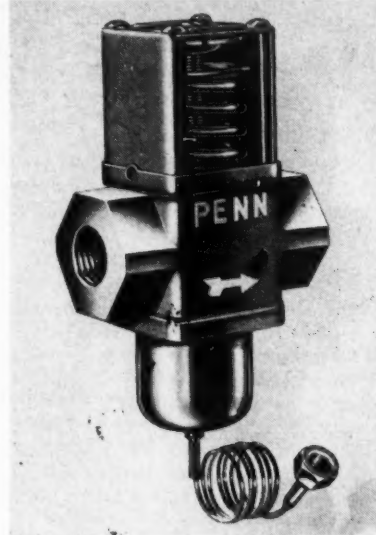
GOSHEN, Ind.—Two new series of water regulating valves for water-cooled refrigeration compressors and condensers have been recently introduced by Penn Electric Switch Co.

Sizes in both series 246 commercial type and series 246-N navy type, for marine service, are available with threaded-, and flanged-type connection. A complete range of sizes from 1/4 inch to 4 inches will be available states the manufacturer.

These water regulators, according to the manufacturer, incorporate greater sensitivity to refrigerant head pressure, minimum spring power requirement, and insure free movement of all working parts. New and inherently different design are claimed to eliminate sticking of seats . . . water hammer . . . drain plugs . . . rusting of range springs . . . need for lubrication . . . corrosion of, and sedimentation on sliding parts. Inlet and outlet water pressure forces on the part are efficiently controlled by the use of two correctly proportioned rubber diaphragms which also serve as gaskets to prevent leakage . . . all sealing bellows are eliminated.

Range spring and sliding parts are not submerged in water. Use of rubber diaphragms and internal design of valve body eliminate necessity for drain plug. Drainage of the valve is not necessary for winter or other standby periods because if freezing occurs, the rubber diaphragms compensate for any expansion with the valve body.

## New Product Ready



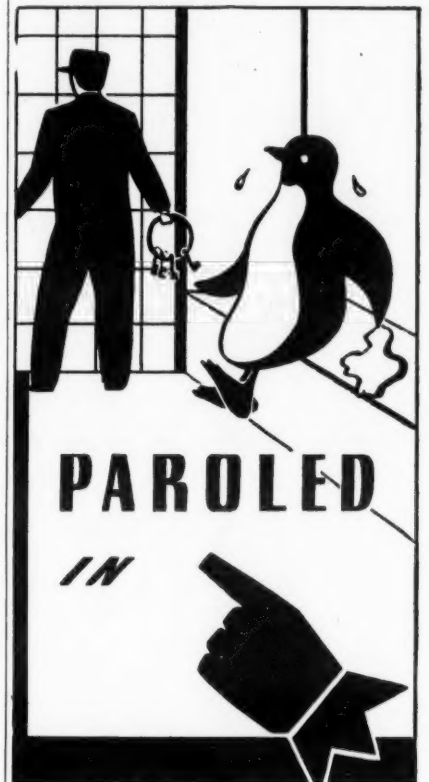
Greater sensitivity to refrigerant head pressure is claimed for the two new series of water regulating valves introduced by Penn Switch.

## Tadlock and Webb Establish New Firm

ATLANTA, Ga.—Planning to concentrate on the sales of locker storage plants and equipment, William A. Tadlock, for 14 years commercial refrigeration specialist with Georgia Power Co., and M. Clayton Webb, business consultant and market analyst, have established the Webb-Tadlock Co. at 258 Spring St., N.W., here. The new firm will also handle other commercial equipment, including ventilating fans.

## Lockers For Richmond Area

RICHMOND, Va.—Plans are being made for erection of a freezer-locker plant in Chesterfield County to be built before July 1. The plant will be the first of its kind in this section of Virginia. In order to secure approval of the WPB, 500 applications for use of the locker by county residents are being made.



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# Thermostatic Expansion Valves In Low Temperature Applications

By F. Y. Carter, Detroit Lubricator Co.

Low temperature refrigeration in the modern day usage refers to those systems where the refrigerant temperatures range from  $-20^{\circ}\text{F.}$  to temperatures well below  $-100^{\circ}\text{F.}$  Refrigerant characteristics, such as the pressure-temperature curve becoming very flat and the specific volume becoming very large, make it desirable to use high pressure refrigerants at these low temperatures, but their use is accompanied by correspondingly higher pressures during pull-down which prohibit their general application in this field.

The three refrigerants most commonly used for this class of work are "Freon-12," "Freon-22," and Propane. "Freon-12" is the lowest pressure refrigerant in the group,

and as a result cannot be used economically at the extremely low temperatures possible with "Freon-22" and Propane.

## Types of Systems

While single stage compression systems are sometimes used in this low temperature work, it is generally necessary to use multiple stage compression or its equivalent at temperatures below  $-60^{\circ}\text{F.}$  Two multiple stage systems, the multi-stage and the cascade, are in general use, with the multi-stage system being subdivided into two classes.

Fig. 1 shows a multi-stage system where a liquid sub-cooler is employed to sub-cool the liquid. The sub-cooled liquid leaving the sub-cooler passes

through the main suction line heat exchanger and is finally delivered to the expansion valve at a temperature approximating  $-40^{\circ}\text{F.}$  and under a normal head pressure. The temperature of the liquid leaving the liquid sub-cooler will vary during a pull-down, inasmuch as the saturation temperature of the sub-cooler depends on the intermediate pressure between the two stages of the condensing unit.

This type of multi-stage system lends itself to applications where pressure type distributors are to be used with multiple pass evaporators.

Fig. 2 shows a multi-stage system where the liquid sub-cooler has been replaced by an auxiliary receiver into which the liquid from the "liquid receiver" is expanded directly. The flash gas thus formed is removed through the sub-cooler suction line and passes into the high stage suction line.

The liquid in the auxiliary receiver has a pressure and temperature corresponding to the high stage suction pressure and consequently the liquid which is delivered to the expansion valve after passing through the main suction line heat exchanger is at a temperature of approximately  $-40^{\circ}\text{F.}$  but at a pressure corresponding to the high stage suction pressure.

This type of multi-stage system is adaptable to applications where a single continuous tube evaporator is employed, and can also be used in conjunction with an overflow type of distributor in which no pressure drop exists.

One disadvantage of this type of system when employing an expansion valve as a refrigerant control is that a very small pressure drop occurs across the expansion valve orifice, with the result that the expansion valve capacity is decreased greatly. Consequently when using expansion valves on this type of system it will be necessary to select the valves with the capacity corrected for this condition.

Fig. 3 shows a general outline of the cascade system. The heat is removed from the refrigerated space by the low stage unit, which in turn delivers this heat to the high stage unit, where it passes out of the system by means of the high stage condenser. The high and low stage condensing units may be charged with the same refrigerant or different refrigerants, but it is to be noted that they are each a complete and separate refrigerating system.

The high stage condensing unit must be large enough to remove heat from the condenser-receiver at a rate fast enough to cool the liquid in the low-stage receiver to a saturation temperature of  $-20^{\circ}\text{F.}$  to  $-30^{\circ}\text{F.}$ , thereby greatly increasing the capacity of the low stage condensing unit.

In effect, the cascade system gives the same results as the multi-stage system. An advantage of the cascade system, however, is that refrigerants may be selected for the low stage unit which will allow smaller low stage condensing units to be used than would be found in a multi-stage unit of the same capacity.

## Expansion Valve Characteristics

Thermostatic expansion valves depend for their operation on varying pressure conditions. Expansion valves are designed so that during normal operation the temperature of the feeler bulb and the corresponding pressure developed within the power element is balanced by the suction pressure plus an adjustable spring force.

By making up the difference with the adjustable spring force it is possible to have the saturation temperature of the power element pressure a few degrees higher than the saturation temperature corresponding to the valve suction pressure, and this difference of temperature is designed as "bulb superheat."

It is customary to adjust expansion valves at the factory so that the needle of the expansion valve will be just barely closed when the valve is adjusted for the superheat setting. The superheat thus measured at the factory with the needle in the closed

(Concluded on Page 17, Column 1)

## Types of Low Temperature Systems

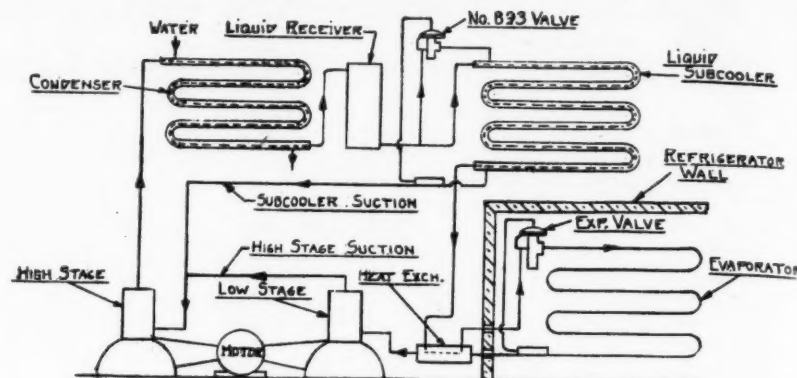


Fig. 1

Multi-stage system in which liquid sub-cooler is used.

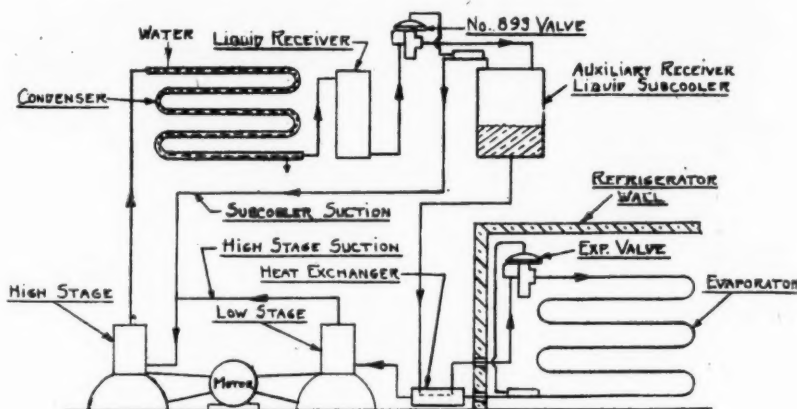


Fig. 2

Multi-stage system making use of auxiliary receiver.

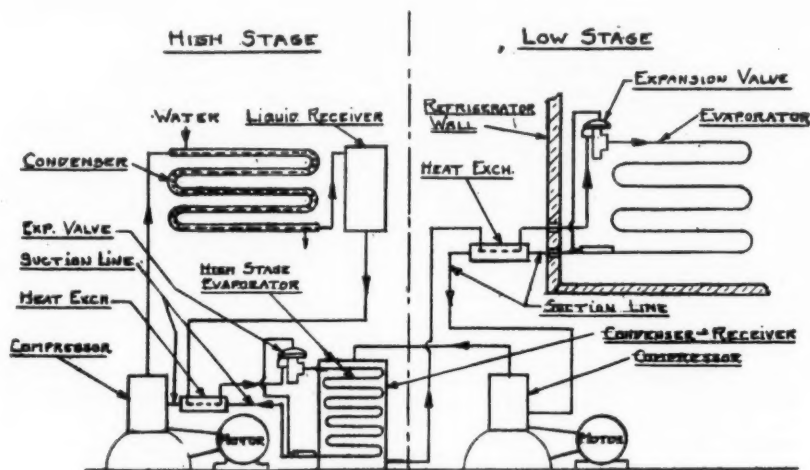


Fig. 3

Cascade system showing relation of high and low-stage units.

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Good wholesome food also fights for freedom both on the battle and home fronts! It must, however, be protected from spoilage and bacteria by proper refrigeration.

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gun powder as well as in the preservation of our nation's—and that of our allies—food supply on all fronts. The lessons we are learning in the production of condensing units for rapidly multiplying applications essential to the winning of the war, will be applied to good advantage in the production of even more efficient peacetime equipment.

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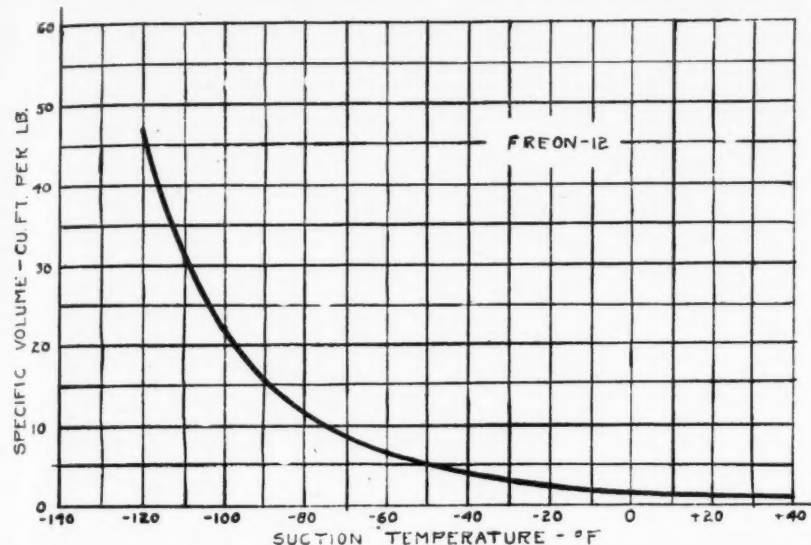
"VIRGINIA" REFRIGERANTS  
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Fig. 4. Specific Volume—Temperature Curve



## Expansion Valves In Sub-Zero Systems

(Concluded from Page 16, Column 3) position is generally referred to as the "static superheat" or "factory setting."

The capacity which an expansion valve will deliver is directly related to the opening of the valve needle. The "control mechanism" or "movable part" of an expansion valve, which includes the power element, the suction pressure element, the needle, and any springs, can be considered as one large spring having an average spring scale or valve modulus.

When the expansion valve needle is just closed it is found that the force exerted by the power element is exactly balanced by the force exerted by the suction pressure element plus the adjusting spring. If the power element pressure is increased slightly, this being accomplished by increasing the feeler bulb temperature while holding the suction pressure constant, it is found that the valve needle opens a definite amount for each degree rise in feeler bulb temperature.

Inasmuch as the capacity of the valve is directly related to the valve needle opening, it follows that the capacity can also be related to an increase in the feeler bulb temperature.

By reference to the pressure-temperature characteristic curve of "Freon-12" it is found that at air conditioning temperatures 3° F. change in bulb temperature causes a pressure change in the power element of 3 lbs. per sq. in. This change in pressure will cause the expansion valve needle to open up to a rated position. Referring to the curve at -100° F. it is found that a 33° F. change in bulb temperature will be necessary to create 3 lbs. pressure difference and cause the expansion valve needle to open to the rated position selected above.

Obviously an attempt to operate at this extremely high opening super-

heat would result in a badly starved evaporator. To prevent such an operating condition it is necessary that the expansion valve be selected so that the needle will open enough to deliver the desired capacity with a small opening superheat, this allowing the evaporator to be fully refrigerated.

Also, by selecting a small opening superheat the expansion valve can move from the demand position to the closed position very quickly, this being especially desirable in the cases of floor over.

If the expansion valve is to operate at low temperature with the same 3° F. change in bulb temperature selected for air conditioning operation, reference to the pressure-temperature characteristic curve will show that the pressure change developed within the power element will be approximately  $\frac{2}{10}$  lb. per sq. in., or approximately  $\frac{1}{15}$  the pressure change which occurred at air conditioning temperatures.

Literally this means that at -100° F. suction temperature the needle valve will be open approximately  $\frac{1}{15}$ th the opening developed at air conditioning temperatures. Inasmuch as the needle opening is greatly restricted under the low temperature operating condition it will be necessary to increase the orifice size to make up the difference if the same capacity is desired.

Practically this means that a very large expansion valve will be selected for a comparatively small capacity low temperature application. This is not at all unreasonable, however, when the equipment needed for the entire low temperature system is considered. The capacity of the compressor in the refrigeration system is directly affected by the specific volume of the suction gas.

A compressor operating at a constant r.p.m. and a high suction pressure will move a much greater weight of gas than the same compressor operating at the same r.p.m. and low suction pressure, due in part to the increase in specific volume of the suction gas at lower temperatures.

Fig. 4 shows the specific volume of "Freon-12" at various suction

temperatures, and indicates the enormous decrease in compressor capacity as suction temperatures approximating -100° F. are approached.

The static superheat characteristic of thermostatic expansion valves governs the range of suction pressures on which they can be operated. A single diaphragm expansion valve charged with the refrigerant on which is to be used will have an increasing closed position superheat as the suction temperature becomes lower. This naturally would prevent this type of expansion valve being used over a great range of temperatures, because obviously this valve would starve an evaporator on low temperatures when the superheat became very large.

This condition can be remedied in the single diaphragm expansion valve by cross-charging the power element with a refrigerant different from the refrigerant on which it is to be used, the charging refrigerant being selected to give suitable static superheat characteristics over the entire range of operation.

Unfortunately it is not always possible to select a stock refrigerant which can be used as the cross-charging fluid, but in this case it is possible to charge the element with a mixture of refrigerants which will accomplish the superheat control desired.

The two-element type of thermostatic expansion valve has a constant superheat characteristic from air conditioning temperatures to extremely low temperatures. This is accomplished by mechanical design, which allows the power element to be charged with the same refrigerant on which it is to be used.

### Range of Operation

The tremendous difference in capacity of the compressor between the high operating pressures occurring during pull-down and the low pressure conditions during low temperature operation results in a difficult refrigerant control problem.

A great many installations have been made where a single expansion valve is employed over the entire range of operation. This is to be desired, but the static superheat of the valve used must remain either constant over the entire range of operation, or increase at the higher operating conditions.

Some other applications use two expansion valves to cover the entire range of operation. A standard single diaphragm expansion valve is employed at high operating conditions, with a second valve either of the thermostatic or constant pressure type employed at the low temperature conditions.

In this type of application the low temperature thermostatic expansion valve employed at the low operating conditions is gas charged with a low maximum operating pressure so that it will not open and feed the system until the suction pressure has decreased to the selected valve. The diaphragm expansion valve employed under the high operating conditions will have a standard charge in the power element which will allow the superheat to increase as the suction temperature decreases. The net result is that the superheat of the high range diaphragm expansion valve increases to a point where it starves the system by the time the low range valve opens and starts to feed.

Once the suction pressure decreases to a point where the low range valve can come into operation

the coil automatically operates at a lower superheat than the standard high range valve can tolerate and as a result the high range valve remains closed during the remaining low range operation.

This same thing can be accomplished by using a thermostatic expansion valve for the high range and a constant pressure expansion valve for the low range. In this application, however, it is necessary to very carefully balance the system so that the constant pressure valve will not overfeed and cause a flood over.

It is safer in this type of system to employ a temperature operated thermostat at the end of the coil in conjunction with a solenoid valve in the liquid line to the constant pressure valve, in order to completely cut off the flow of refrigerant when the coil becomes filled with liquid.

In some low temperature applications a smaller valve than recommended above has been used. In these applications the expansion valve feeler bulb has been placed on the suction line at a distance from the evaporator, allowing the expansion valve to operate at an extremely high superheat.

In this manner the flow at the lower temperature is obtained with a smaller valve than recommended, but the control of the refrigerant in the evaporator is not as accurate due to the fact that a tremendous amount of superheat must be picked up in the suction line between the end of the evaporator and the feeler bulb location.

In this type of application the ambient temperature surrounding the suction line will influence the amount of superheat therein and correspondingly influence the extent to which the evaporator is refrigerated.

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## Wartime Specifications For Shipboard Water Coolers

By James J. Corey

Good drinking water on shipboard is first on the list of important foods for passengers and crew. Very often too little study is given to providing it. Actually good drinking water is a result of many years of research. Constant vigilance is required to maintain proper standards.

Most of us know that drinking water must be pure—and prefer it at "spring water" temperature. Beyond that, few realize that a normal person should drink  $\frac{1}{2}$  to 1 gallon of water per day to preserve good health.

"Good drinking water" by the accepted medical standard must be:

1. Pure.
2. Accessible.
3. At proper temperature.
4. Of ample supply.
5. Palatable—i.e., free from disagreeable odor, color or taste.

### WATER COOLERS AT WAR

The U. S. Navy uses self-contained

mechanical coolers to provide good drinking water. Such units provide flexibility of installation and facilitate spacing convenient for crew or other personnel. Unlike other systems—mechanical breakdown does not affect the entire ship's water system.

Consider for a moment the impact of war conditions on shipboard water coolers . . . the shock of gunfire . . . the pitch and toss of heavy seas . . . ships overcrowded far beyond planned capacity . . . water supply and air temperatures ranging from arctic to tropic . . . water supplies varying in sediment and vegetable matter content, as well as in chemical analysis . . . repair of damage and mechanical adjustment under emergency conditions, etc.

### MODELS AVAILABLE

As a conservation measure, and after consultation with all govern-

ment agencies, WPB issued Limitation Order L-126. This order specifies three essential sizes for shipboard. (See Fig. 1).

### NAVY SPECIFICATIONS

The revised Navy specification is known as 63-C-4 (INT). This revision was brought about through improved mechanical design required by Bureau of Ships to assure satisfactory operation under war conditions. Therefore, water cooler specifications for ocean-going or combat ships should require compliance with 63-C-4 (INT).

### FEDERAL PROCUREMENT SPECIFICATIONS

The latest specification is known as E-00-C-566, dated June 25, 1942. Its use is often applicable to inland water-way boats when not equipped with guns.

Fig. 1—Type Sizes  
And Capacities

TYPE A—ELECTRIC BUBBLER STORAGE TYPE (FOR MARINE AND NAVY USE ABOARD SHIP—AIR-COOLED).

Capacity Size	Minimum G.P.H.	Peak load capacity in 15-minute period, min. Gallons	Maximum fix- ture equipment authorized
5	5 G.P.H.	1.87	1 bubbler assembly and 1 glass-filler.
10	10 G.P.H.	3.75	2 bubbler assemblies and 1 glass-filler.
20	20 G.P.H.	7.50	2 bubbler assemblies and 1 glass-filler.

Note: Type A cooler capacities are based on the use of a waste water pre-cooler using 60% spill. The above specified capacities are based on an ambient temperature of 100° F. inlet water temperature of 100° F. to 50° F. outlet drinking water.

### REQUIREMENTS

1. Refer to Fig. 1, the minimum capacity quick draw test. This requirement is important because the crew often "gangs up" on the cooler at irregular intervals. Bureau of Ships for example, requires that after the cooler has stopped on one of its normal cycles, the respective minimum peak load capacity shall be withdrawn in 15 minutes.

During this test, the outlet (drinking water) temperature from the cooler shall be not less than 40° F. and not more than 50° F. Of course, one way to "get by" on this quick draw test is to provide a very large cold water storage tank. This is not a desirable practice because of the slow temperature recovery rate in a large tank.

Going to the other extreme involves placing the cooling element inside the water coils or tank. This however, raises the possibility of a freeze-up in the tank or coil, necessitating extra protective controls, (which are an added maintenance problem).

The best method is to use a moderate size storage tank in balance with a refrigeration unit of the proper size keeping the refrigerant coil in external contact with the storage tank.

### NAVY—300% OVERLOAD CAPACITY REQUIREMENT

2. This requires that drinking water be drawn from the cooler at a rate of 300% of the maximum rated capacity without overloading, overheating, or interrupting the operation of the motor. For example, a rescue job or an overloaded transport may result in 150 men using a water cooler originally designed and installed to serve only 50 men. Obviously water coolers must be installed that won't "die on the vine" under these conditions.

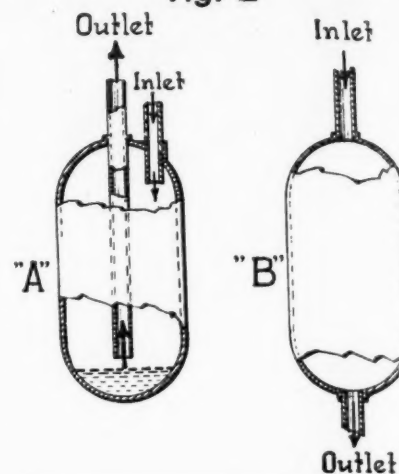
Similarly, despite the fact that standard specifications cover operating conditions of 100° inlet water, water coolers must be provided that will function satisfactorily under much higher temperatures.

### CABINET CONSTRUCTION

3. The cabinet "shall be constructed with a steel frame to support the mechanical, electrical equipment, and storage tank. The base of the cabinet shall be rigid and sufficiently strong to carry the weight of the entire equipment . . ." In other words, the cabinet shell should not be relied upon to support the weight of these working parts under the stress, strain and shock of gunfire. Independent, rigid support is essential to keep these working parts in alignment.

Easily removable cabinet panels provide both time and money-saving features. In a rough sea, if any heavy

Fig. 2



object crashes against the water cooler, properly designed panels assembled independent of frame structure act as a shock-absorber, protecting the structure and alignment of working parts. They facilitate access to all working parts from any position or angle.

If an individual panel is damaged, it can be replaced with negligible cost in contrast with replacing the entire cabinet. Such repair (or even occasional re-painting) can thus be accomplished conveniently without removing the cooler or interrupting its use.

### RAT-PROOFING

4. Rat-proofing shall consist of suitable rust-proof wire mesh, or louvers, or perforations in steel sheets. The mesh or opening shall not be greater than  $\frac{1}{8}$  inch. This is obviously an important requirement and frequently omitted in bids for shipboard water coolers. Incidentally, it is well to consider the use of this requirement in bids for land use water coolers—docks, shipyards, etc.

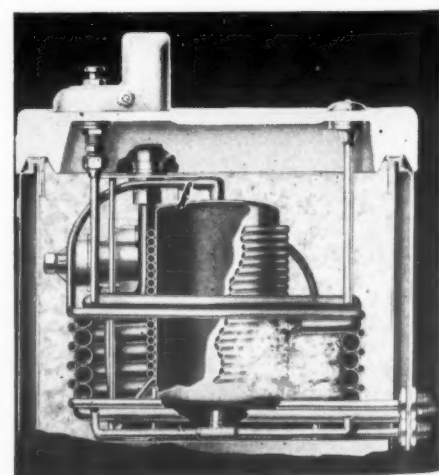
### RESILIENT MOUNTINGS (CONDENSING UNIT)

5. Specifications require the equipment shall be suitable for use on board ship. Provision shall be made for satisfactory operation when violently tipped. Care should be taken to include this requirement in all shipboard coolers. Unless the resilient mountings used to cushion the machine vibration are adequately secured, the working parts may be thrown permanently out of adjustment or damaged in heavy seas or under gunfire.

### STORAGE TANKS

6. Sanitary construction of the cooling unit is important. A self-draining storage tank, (continuously draining from the bottom) has par-

Fig. 3



ticular merit. Fig. 2 shows two types of construction.

In design "A" the warm water enters the top of the tank, is cooled and withdrawn in the tube which

(Concluded on Page 19, Column 1)

**Superior has gone to War!**

- ★ DIAPHRAGM PACKLESS VALVES
- ★ PACKED AND PRESSURE CUP VALVES
- ★ CHECK VALVES AND LIQUID INDICATORS
- ★ DEHYDRATORS AND FILTERS
- ★ MANIFOLDS AND HEAT-EXCHANGERS
- ★ FITTINGS AND ACCESSORIES

Even though we are working "round the clock" on implements of war, every passing month strengthens our conviction that refrigeration equipment is so vitally essential that we should continue to allocate an increasing percentage of our manufacturing facilities, personnel and planning to our refrigeration products.

THAT'S OUR POLICY . . . continuing to do even a better job of supplying, as promptly as conditions will permit, more valves, manifolds, heat exchangers, dehydrators, liquid indicators, fittings and accessories to manufacturers, jobbers, installers and service engineers.

Write for Copy of Catalog R-2

**SUPERIOR VALVE & FITTINGS CO.**  
1509 WEST LIBERTY AVENUE  
PITTSBURGH, PENNSYLVANIA

**The Greatest Achievement  
IN REFRIGERATION CONTROL SINCE THE  
INTRODUCTION OF THE THERMOSTATIC  
EXPANSION VALVE.**

**THE KRAMER Balance Loader SYSTEM** (Patented) is a modulating refrigeration system capable of varying from 0% to 100% of full load, and maintaining a fixed minimum back pressure in the suction line and in the compressor crank case.

The KRAMER SYSTEM will automatically compensate for varying evaporator loads, resulting in an infinite number of compressor capacity points, giving straight line capacity modulation.

The KRAMER SYSTEM is the only one that will give a full range of modulation at a fixed minimum back pressure throughout the entire low side.

The KRAMER SYSTEM can be applied to new or existing refrigeration installations. Send for Catalog BL-342.

**KRAMER TRENTON CO., TRENTON, N. J.**  
*Heat Transfer Products*

BLAST COOLING COILS • BLAST HEATING COILS • AIR CONDITIONING UNITS • COMFORT COOLERS  
UNIT HEATERS • COPPER CONVECTORS • FINNED COILS • BARE TUBE COILS • PLATE COILS  
CONDENSERS • HEAT INTERCHANGERS • WATER COOLING EVAPORATORS • ICE MAKERS  
UNIT COOLERS: Coolmaster—Panel Type—Floor Type—Freezing Oven—Freezing Shower  
COMBUSTION ENGINE RADIATORS • • • • • OIL COOLERS.

**POSTWAR?**

You can't keep a creative mind in war chains. You can't 'date' thinking and planning. Of course you are thinking about postwar refrigeration—so are we. To be sure, ordinance is our job right now—we are not making compressors for the duration. But we are working on new postwar refrigeration—and are eagerly awaiting the proper time to discuss it with you.

**MERCHANT & EVANS COMPANY**  
PHILADELPHIA, PENNA. • Plant: LANCASTER, PENNA.

**M&E**  
EST. 1866



## Wartime Specifications For Shipboard Water Coolers

(Concluded from Page 18, Column 5)  
leads upward through the top of the tank to the bubbler.

In design "B" the warm water enters the top of the storage tank, is cooled and withdrawn from the bottom of the tank through the feed line to the bubbler. It will be noted that sediment and vegetable matter are occasionally present in water supply. In design "B" it is impossible for this matter to accumulate on the bottom of the tank and sanitary hazards are thus avoided. Maximum efficiency is accomplished in design "B" by the use of proper baffling, in no way interfering with the sanitary features.

External contact of the refrigerant coils to the water tank also has sanitary advantages. Fig. 3 shows such an assembly. The refrigerant coils are externally wound and metal-lically bonded to the storage tank. The externally wound cooling coil eliminates any possibility of the refrigerant leaking into the drinking water.

### PRECOOLERS

7. Bureau of Ships and Federal Procurement specifications now recognize the use of precoolers, as does Limitation Order L-126. (In normal use, approximately 60% of the water flowing from the bubbler runs down the waste pipe—about 40% is consumed. This 60% is not wasted if efficiently utilized to reduce the temperature of the warm incoming water).

There are several types of precoolers and this is not a subject to be treated lightly. Immersing the waste line directly in the drinking water supply line (or vice versa) offers the slight risk of a leak from the waste line contaminating the fresh water supply.

Then, too, a clog-up of the waste line must always be avoided. Unfortunately, remnants of cigarettes, etc., find their way down the drain. If the warm water supply line is immersed (for precooling purposes) in the waste line, sooner or later this debris accumulates on the warm water supply line, reducing heat transfer, and ultimately clogging the waste line completely.

Bureau of Ships states "precoolers furnished shall be of the unrestricted drain type" and states additionally, "the drainage system so designed to carry out all drainage rapidly . . ." Fig. 4 shows a truly unrestricted type of pre cooler which is also completely sanitary. It should be noted that the incoming water flows upward through a coil tube which is metal-lically bonded to the outside surface of the larger down-flowing waste line. Here again, external surface bonding provides maximum heat transfer efficiency and eliminates any sanitary hazards.

### WATTS PER GALLON COOLED

8. It is interesting to note that due to recent development progress in

efficient water cooling, it has been possible for the Bureau of Ships to reduce on power consumption per gallon of water delivered. Compare the Navy requirements Fig. 5, the wattage allowed in the old specification versus the wattage allowed in the new specification. This reduction in electrical current consumption is due entirely to efficient mechanical design. We know it is important to keep the load on the ship's power plant at a minimum and it would therefore, be advisable to require bids

Fig. 4

### NAVY REQUIREMENTS

Size	Old Spec. Watts	New Spec. Watts
5	140	60
10	90	50
20	70	45

Watts per gallon delivered based on 100° F. air while reducing temperature of water 100° F. to 50° F.

for water coolers to be accompanied by certified copies of test reports showing the wattage required per gallon of water delivered under specified test conditions.

### INSTRUCTION BOOKS

9. A complete and well-edited manual (instruction book) is a boon to the ship's engineer. It is always wise, before making a water cooler purchase, to review the manufacturer's instruction book to be sure that it is adequate.

### SPACE AND WEIGHT

10. There is considerable variation in the dimensions of various makes of water coolers. With deck space at a premium, the space-saving possibilities should be surveyed in analyzing bids.

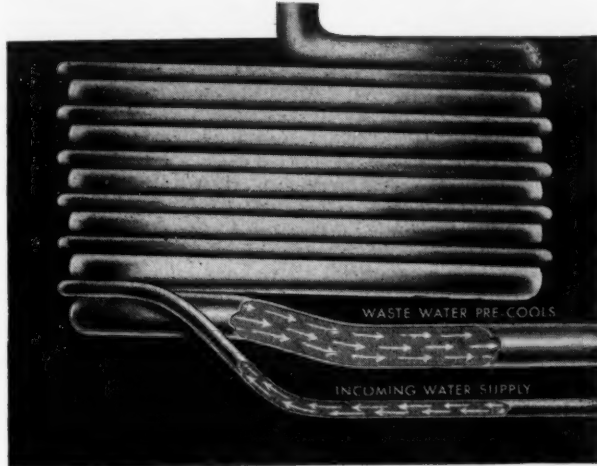
Similarly there is considerable difference in weights. Sturdy construction must be assured, yet possibility of unnecessary weight should be avoided.

### TESTING AND DEHYDRATING

11. Of course the best materials, properly assembled, will give continuing good results only if they are properly cleaned and dehydrated and thoroughly tested before leaving the factory. Good practice requires the complete dehydration of all refrigerant-containing parts at temperatures of at least 200° F.

Simultaneous with dehydration, each part should be subjected to a vacuum of 28 inches throughout the drying period to lower the boiling point of moisture and remove any vapor. By adequate tests of each unit before shipment, such as recording of pressures and temperatures and operating cycles, many hours of testing and adjustments are saved when installation is made. This should be a factory job and not that of the ship's engineer.

Fig. 5—Pre-Cooler As Per Specifications



In this type of pre-cooler the incoming water flows upward through coil tube which is metal-lically bonded to the outside surface of the down-flow waste line.

## Norge's 'Portable' Furnace For Army Air Forces Has Many Possibilities For Domestic Heating

DETROIT—A new portable self-powered, automatic forced warm air furnace, weighing only 45 pounds and comparable in size to an average traveling bag, has been developed for the Army Air Forces for a variety of undisclosed ground and flight applications, it is announced by Howard E. Blood, president of Norge division of Borg-Warner Corp.

Equipped with its own fuel supply and a tiny precision-built prime mover, this sealed unit provides a flow of pure heated air in sufficient quantities to keep an average single family home warm in the coldest weather, Mr. Blood said. The development, resulting from more than two years of research and experiments by Norge division, may play an important part in domestic heating after the war.

In tests conducted at the United

States Bureau of Standards in its High Altitude Chamber and in the Low Temperature Research Chamber at Northwestern University, the Norge unit operated successfully at five miles altitude and with temperatures as low as -70° F., Mr. Blood explained. Visualizing its post-war possibilities for home heating, Mr. Blood declared:

"Automatic climate conditioning of each room separately has long been desired to eliminate the present practice of heating rooms unoccupied for a portion of the day or night. As a nation, we are unnecessarily spending millions of dollars annually in maintaining 72° F. in vacant rooms. A terminal system utilizing the peacetime version of this unit would allow the home owner to conveniently recapture up to 30% of his fuel bill regardless of the type of fuel used."

## 'Get Accounting In Order' War Contractors Told

NEW YORK CITY—With the Baruch-Hancock standard termination clause now established all war contractors, particularly the smaller ones, should immediately so arrange their accounting systems to make possible quick, and efficient war-to-peace reconversion, Dr. Fred I. Kent, chairman of the Commerce and Industry Association of New York's postwar planning committee, declared recently.

Urging all companies to make a study of inventories in preparation for cancellation of war contracts, he admitted that manufacturers face many unknown factors and that, while no inflexible plan can be set up at present to meet cancellation exigencies, such matters as agreements with bankers can and should be reached well in advance in order to insure prompt and accurate liquidation of claims when the critical time arrives.

"With complete understanding thus established by prior consultation," he said, "these two sides of any loan questions which might arise upon cancellation, where industries would require a return of capital which had been invested in raw materials, the processing of goods, etc., no time need be lost when cancellation of war contracts takes place."

## Dual Refrigeration Co. Formed In Hollywood

HOLLYWOOD, Calif.—Dual Refrigeration and Engineering Co. is the firm name under which William A. Hargrave has published an intention to conduct business at 1241 N. Vine St., Hollywood.



## IMPERIAL TORPEDO DEHYDRATOR

NEVER before in the history of the refrigeration industry has the dehydrator been as important an item as today. Since old machines cannot be replaced—they must be repaired. And every time a unit is torn down, it is essential that all possibility of moisture be eliminated—a job for a dehydrator.

For drying out a system the most formidable weapon in this war on moisture is the Imperial Torpedo Dehydrator. This is the dehydrator that was first announced in December, 1940,

and immediately established an amazing performance record.

Here are the features that have set an entirely new standard in dehydrator construction:

- One piece streamlined shell
- Fewer joints — no soft solder — less chance of leakage
- Copper and brass construction
- Packed with "Silica Gel"

Torpedo Dehydrators are built in sizes up to 7 h.p. Available under L-126.

THE IMPERIAL BRASS MFG. CO., 565 S. Racine Ave., Chicago 7, Ill.

## IMPERIAL

STRAINERS • DEHYDRATORS • VALVES • FITTINGS • FLOATS • CHARGING LINES  
TOOLS FOR CUTTING, FLARING, BENDING, COILING, PINCH-OFF AND SWEDGING

## DISTRICT SALES REPRESENTATIVE

Airtemp Division, Chrysler Corporation, has an opening for a District Sales Representative to sell a complete line of air conditioning, heating, and commercial refrigeration equipment to and through dealers.

Consideration will be given only to men thoroughly experienced in selecting, selling, and supervising dealers handling major mechanical appliances which require specialty selling methods. Preference given to those with experience in lines we manufacture.

During war applicant must work closely with industrial plants and military authorities. Must be capable of developing an expanded postwar dealer organization.

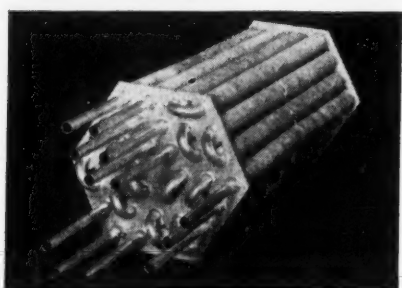
Employment is on a straight salary basis, with automobile and traveling expenses furnished. Apply in writing only, giving business history, salary requirements, draft status and WMC availability. Address:

Sales Manager, Dept. 620  
Airtemp Division, Chrysler Corp.  
Dayton, Ohio



## ROME-CONDENSER

### ★ Jointless Type ★



Rome Water Cooled Condenser Coils insure trouble-free condensing equipment. Used by leading compressor manufacturers.

## ROME-TURNEY

### RADIATOR COMPANY

222 CANAL ST.  
ROME, N. Y.



CORDLEY & HAYES, NEW YORK, N. Y.

## Servicing the G-E Refrigerator Line

From the General Electric Service Dept.'s  
'Appliance Service Handbook'

Editor's Note: This is the second of a series of articles describing the servicing of refrigerators manufactured by General Electric Co. The first article appeared in the Jan. 17 issue of the News.

### Types of Refrigerating Machines

There are two general groups of machines, Sealed and Open-type. Sealed machines have the motor and compressor parts sealed in a metal case with a forced-feed oil system for lubrication and cooling. The majority of General Electric refrigerating machines are Sealed. Open-type or "Conventional" machines have the motor external.

There are three basic types of

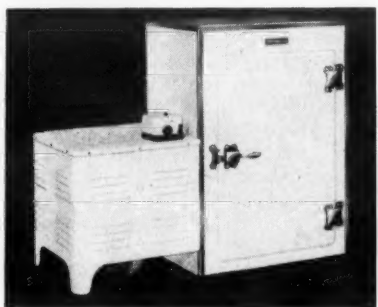


Fig. 15—DA-1 machine.

Sealed machines, the DR Type manufactured from 1927 to 1933, the CA Type manufactured during 1933 and 1934, and the Scotch-yoke Type manufactured from 1934 to 1943 (CE, CF, CG, CH, CJ, CK, DK, FBA, and LK).

DR and CA machines are known as Monitor Tops; that is, the sealed mechanism is installed on top of the cabinet. There is one exception to this, the DA-1 machine, which although of the DR Type, is installed at the side of the cabinet. The DR has a reciprocating type compressor while the CA has a rotary type compressor.

Scotch-yoke machines are Sealed machines with a Scotch-yoke type compressor. They were manufactured principally as Monitor Tops and Flatops, the latter being those with the sealed mechanism installed in the bottom of the cabinet. However, there are a few special models such as the Ball Top CG, the Under Drainboard DK, and the Liftop LK.

Open-type machines consist of CB, CD, and CM machines and are installed in Flatop cabinets. CB, CM-1, and CM-2 have the motor-compressor assembly mounted in the top of the cabinet. CD, CM-32, 33, 34, 311, and 312 machines have the motor-compressor assembly in the bottom of the cabinet. CM-35 machine is a replacement for heavy-duty DR machines and fits on top of the cabinet.

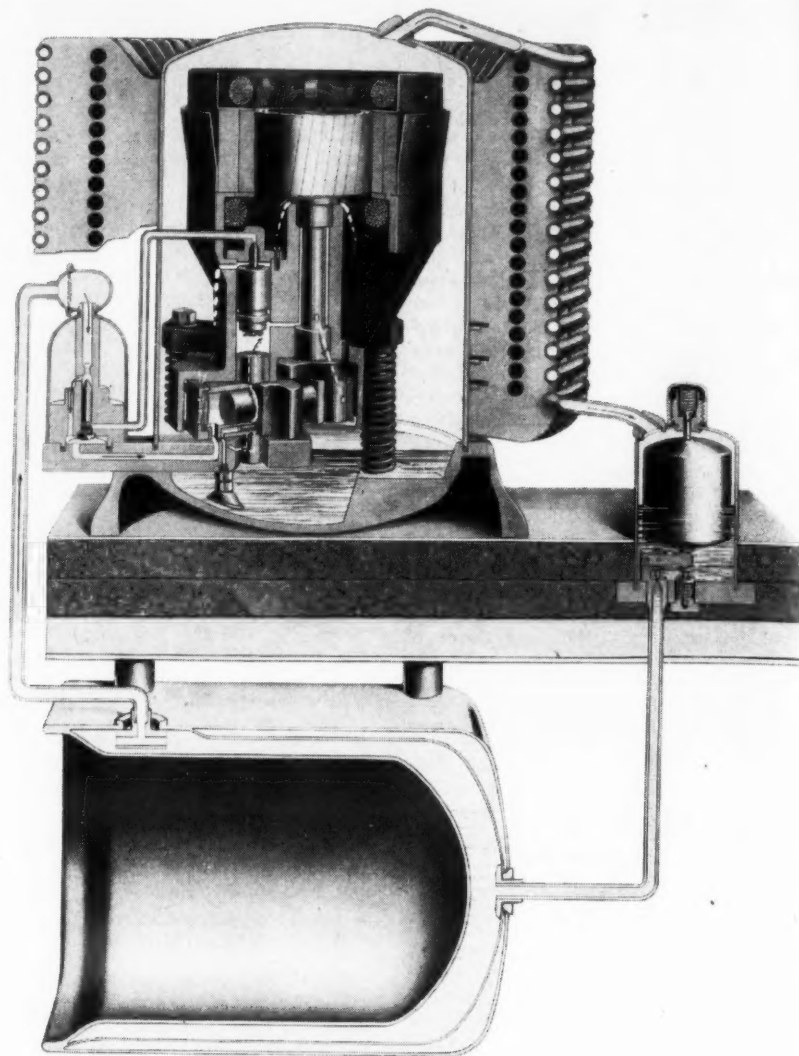


Fig. 16—Cross-sectional chart of typical DR machine.



## ...YOUR 4TH WAR LOAN QUOTA

**W**HETHER your plant meets its quota, or fails, lies largely in your hands. Your leadership can put it over—but if you haven't already got a smooth running, hard hitting War Loan Organization at work in your plant, there's not a minute to lose.

Take over the active direction of this drive to meet—and break—your plant's quota. And see to it that every one of your associates, from plant superintendent to foreman, goes all-out for Victory!

To meet your plant's quota means that you'll have to hold your present Pay-Roll Deduction Plan payments at their all-time high—plus such additional amounts as your local War Finance Committee has assigned to you. In most cases this will mean the sale of at least one \$100 bond per worker. It means having a fast-cracking sales organization, geared to reach personally and effectively every individual in your plant. And it means hammering right along until you've reached a 100% record in those extra \$100—or better—bonds!

And while you're at it, now's a good time to check those special cases—growing more numerous every day—where increased family incomes make possible, and imperative, far greater than usual investment through your plant's Pay-Roll Deduction Plan. Indeed, so common are the cases of two, three, or even more, wage-earners in a single family, that you'll do well to forget having ever heard of '10%' as a reasonable investment. Why, for thousands of these 'multiple-income' families 10% or 15% represents but a paltry fraction of an investment which should be running at 25%, 50%, or more!

After the way you've gone at your wartime production quotas—and topped them every time—you're certainly not going to let anything stand in the way of your plant's breaking its quota for the 4th War Loan! Particularly since all you are being asked to do is to sell your own people the finest investment in the world—their own share in Victory!

**LET'S ALL  
BACK THE ATTACK!**

This is an official U. S. Treasury advertisement—prepared under auspices of Treasury Department and War Advertising Council.

Table 1—Scotch-Yoke Machine Data

Refrigerant—Sulphur Dioxide (A few models use Freon-12. See rating plate on machine.)

Machine	Capacity* B.t.u. Per Hr.	Motor Hp.	Cabinets Used In Size: Cu. Ft.	Type	Condenser
CE-34	1000	3/4	12, 15, 16		
CE-140	450	3/4	4	Flatop	Finned Tube with Fan
CE-340	1000	3/4	12, 15		
CF-1	480	3/4	4, 5		
CF-2	530	3/4	6, 7, 8		
CF-11	480	3/4	5		
CF-21	530	3/4	6		
CF-22	750	3/4	6, 7, 8	Flatop	Flat Plate
CF-28	550	3/4	6, 8		
CFS-1	480	3/4	4		
CH-1	450	3/4	3		
CJ-1	450	3/4	3, 4		
CJ-2	400-500	1/2 or 3/4	6		
FBA-1	450	3/4	4		
CG-1	450-480	3/4	3, 4	Monitor Top	See Note 1
CK-1	480	3/4	5		
CK-2	530	3/4	6, 7	Monitor	Cylindrical
CK-15	480	3/4	6		
CK-26	530	3/4	6	Top	Plate
CK-28	530	3/4	8		
CK-30	730	3/4	9		
CK-35	780	3/4	10 to 18		
DK-1	450	3/4	3	Under Drainboard	
LK-1	450	3/4	2		
LK-2	450	3/4	2	Liftop	See Note 2

Note 1—CG-1 machines have special condenser in box top.  
Note 2—LK machines have special condenser in cabinet walls.  
\*100° F. Room, 20° F. Evaporator.

Table 2—CA Machine Data

Refrigerant—Methyl Formate

Machine	Capacity* B.t.u. Per Hr.	Motor Hp.	Cabinets Used In Size: Cu. Ft.	Type	Condenser
CA-1	430	3/4	4, 5	Monitor	Cylindrical
CA-2	480	3/4	7	Top	Plate

\*100° F. Room, 20° F. Evaporator.

Table 3—DR Machine Data

Refrigerant—Sulphur Dioxide

Machine	Capacity* B.t.u. Per Hr.	Motor Hp.	Cabinets Used In Size: Cu. Ft.	Type	Condenser
D-2	440	3/4	5, 6, 7		
D-15	370	3/4	4		
D-30	590	3/4	7, 8, 9	Monitor	
D-31	590	3/4	7, 8, 9	Top	
D-35	620	3/4	10 to 18		Open Coil
D-40	1100	3/4	10 to 18		
DA-1	320	3/4	4	Under Drainboard	
DR-1	250-330	3/4	3, 4		
DR-2	300-385	3/4	5, 6, 7		
DR-3	600	3/4	10 to 18	Monitor	
DR-35	620	3/4	10 to 18	Top	
DRA-2	320-360	3/4	4		
DRA-4	1100	3/4	10 to 18		
DRB-3	500	3/4	7, 8, 9		
DRB-31	590	3/4	7, 8, 9		
DRE-3	610	3/4	10 to 18		
DRE-4	1100	3/4	10 to 18		

\*100° F. Room, 20° F. Evaporator.



## Fruit-Packing Firm Signals Its Choice of Refrigeration Over Dehydration In Equipping Processing Plant

*Had Experimented With Both Types Before Making a Choice*

BIGLerville, Pa.—Long familiar with the advantages of refrigeration in the storage and handling of fruit, the C. H. Musselman Co., operating a large fruit packing plant here, last spring chose refrigeration instead of dehydration when it foresaw the shortage of cans for fruit preservation.

The Musselman company is located in the heart of an excellent fruit-growing section and produces jellies, fruit juices, frozen fruits, slices and dehydrated fruits, apple butter, cider, vinegar, and tomato juice. Miles of conveyors speed the processing of the fruits and the handling of containers. In 1934 the firm installed at the plant here a 125,000-bushel capacity fruit storage room refrigerated by Frick equipment. Extensive rooms for holding fresh fruit at above 30° F. were augmented by freezer rooms maintained at 0° F.

### FREEZING TUNNEL USED

Last spring a complete "Frick-Freezing" system was installed. A freezing tunnel was built in one of the former low temperature storage rooms to handle apples packed in cardboard containers lined with cellophane, each carton holding 25 pounds of sliced fruit and five pounds of sugar.

The freezing tunnel measures 57 by 28 ft. 7 in., by 10 ft. high, and is arranged in two bays, the fans extending along each of the outer sides. A row of posts stands in the center, where the air rises before dividing and passing over the two sets of nested VW coils.

There are five Lau blowers, of the squirrel cage type, on each side of the tunnel. Structural steel is used to support the coils and the blowers; wooden doors permit access to the coils.

### RACK AND COIL ARRANGEMENT

Wooden racks are laid between the layers of cartons, on the push trucks, to separate and hold in place the packages. Sliding doors at one end of the tunnel admit the lift trucks. Care was taken to allow sufficient headroom for men to walk upright through the tunnel. Wooden boards are stood on edge, along the bottom of each truck frame, to keep the air from short circuiting under the trucks.

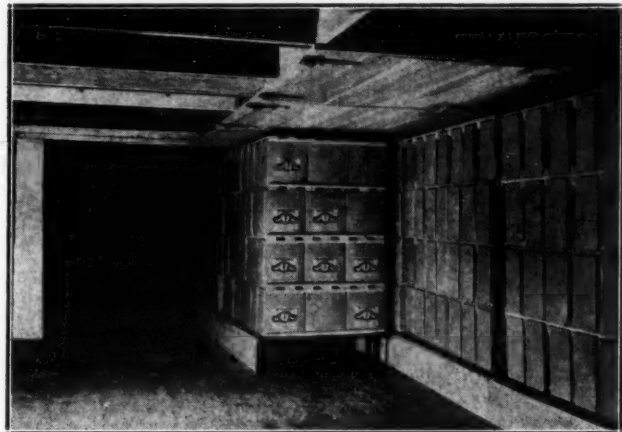
The VW coils are joined by large headers running lengthwise of the bunks and serving as accumulators. Float-valve control is used on the liquid feed. The liquid ammonia is precooled in coils submerged in a bath of liquid in the gas cooler which handles the discharge from the booster compressor. This machine is a 13½ by 9 inch unit with V-belt drive; it operates at 400 r.p.m.

### SPECIAL CONSTRUCTION USED IN STORAGE ROOMS

Connected into the suction of the booster are also the coils from the low-temperature storage rooms. Two big new zero-degree rooms have been added to the building; these have a floor area 83 by 48 feet. Wooden construction is used, but the columns and beams are of such unusual size that they are stronger than the average steel framing.

The posts measure 14 inches square and the main supports for the second floor are composed of four pieces of oak, each measuring 3 in. wide by 20 in. deep. Ceiling coils fed by ½ in. thermal expansion valves, carry the cooling load in each of

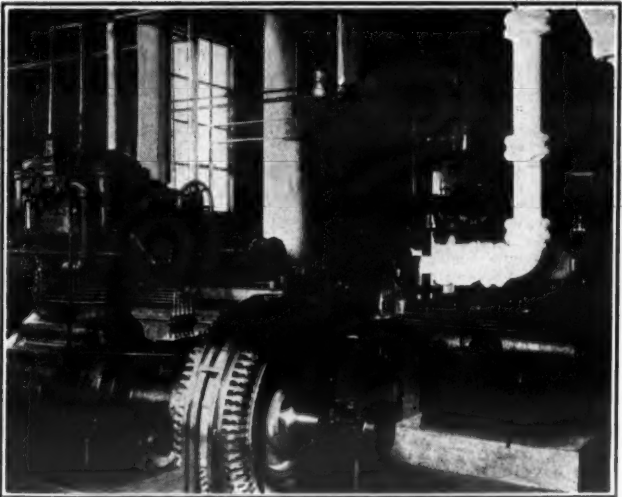
### 'Cold Processing' of Fruits and Fruit Juices



View into one side of the double tunnel at the Musselman quick-freezer in Biglerville, Pa.



Zero degree storage room, with cartons of frozen apples and four wooden spacing racks.



Refrigerating machine room with view of 10 x 10 machine, shell condenser, and new 13½ by 9 booster compressor.

these new rooms. Cork insulation, 6 in. thick, is employed.

The design was developed by Van Rensselaer H. Greene, consulting engineer of New York City, who also supervised all the new work.

The tunnel will be used for freezing all kinds of fruits, in season. The demand for foods frozen in it has already exceeded the supply. A single baker of pies, for example, will order a carload of frozen fresh apples; these are dispatched in refrigerator cars cooled with salt and ice.

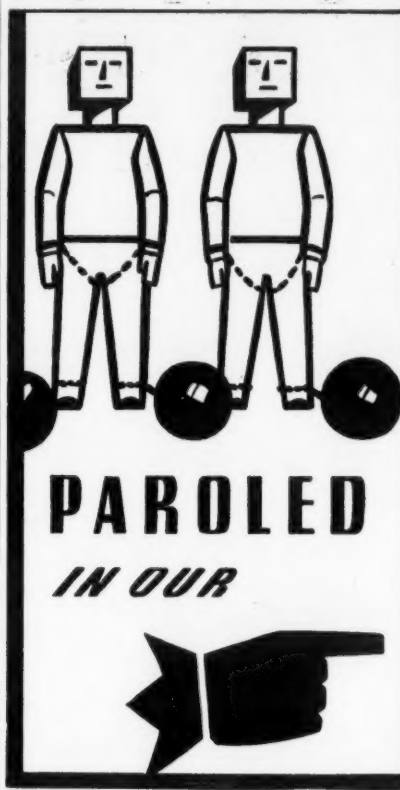
## Army, Navy Okay on Deferments Is Plan

WASHINGTON, D. C.—National Headquarters of the Selective System has announced that in the future Army, Navy, or other Government agency representatives in industries and plants may be asked, where production urgency requires, to make joint certification with employers as to the necessity of workers in such plants for whom deferments are sought.

The plan and procedures provide: 1. Certification by Army, Navy, or other government agency representatives as well as by the employer that an individual registrant is necessary to production and should be deferred.

2. Certification by Army, Navy, or other government agency representatives as well as by the employer that replacement schedules and the deferments requested in accordance therewith are required to meet production.

The certification by an Army, Navy, or other government agency representative is filed as a supplement to the Selective Service Request for Occupational Deferment.



**CONTAINS:** A clear, quick, easily understood reference guide on Lau Single Inlet Blower Wheel and Hub Dimensions—Lau Standard Blower Housing Dimensions—Lau Universal Housings—Lau Wheel Performance Curves from 5" x 2½" to 18" x 9" ... eleven complete charts compiled in accordance with A.S.H.&V.E. and N.A.F.M. Test Codes. Of particular interest is the Lau Wheel Length Selector Curve. Here's an easy way to select the right air handling equipment, to meet your present war needs for wheels, housings, or complete assemblies. Let this Catalog also be a guide to you in your postwar planning.

✓ Send for your Free Copy of Bulletin No. 75

**THE LAU BLOWER COMPANY**  
2001-2009 HOME AVENUE, DAYTON 7, OHIO

## OUR PLANS ARE MADE! ..... HOW ABOUT YOURS?

Distributor, Dealer, Salesman, Serviceman, Importer, Exporter, Compressor Manufacturer, Parts Manufacturer or Jobber . . . we're all in the same boat, co-related in one way or another. It's up to us to work together, for team-work assures post-war success.

Our post-war plans are complete . . . we're ready to go as soon as the shooting stops.

Our plans are flexible and will easily dovetail into yours. Let's get together for double-barrelled action and certain security.

**YOU ASK THE QUESTIONS . . . WE'LL FURNISH THE ANSWERS.**

Don't delay . . . fill in the attached coupon and mail today.

**FOGEL REFRIGERATOR COMPANY**  
Philadelphia, Penna.

## GET STARTED NOW! SEND THIS IN TODAY.

Post War Plans Dept. 27,  
Fogel Refrigerator Co.,  
Philadelphia 37, Pa.

Gentlemen:  
☐ Send me a blueprint of your post war plans, when available.  
☐ Send me a list of new items for post war production, with description, prices, etc.  
☐ Tell me how my firm can fit into your post war plans.  
☐ Give me information on Fogel items directly concerning my business.  
☐ Furnish a list of items for which you are now accepting orders for delivery later.  
☐ I am particularly interested in the following types of equipment: .....  
☐ How can I handle Fogel products in my territory?  
(a) My territory covers .....  
(b) I now handle the following lines of merchandise .....  
☐ Give me details of your deferred payment plan.  
Name .....  
Firm .....  
Type of Business .....  
Street Address .....  
City and State .....

Commercial and Domestic  
**REFRIGERATOR HARDWARE**



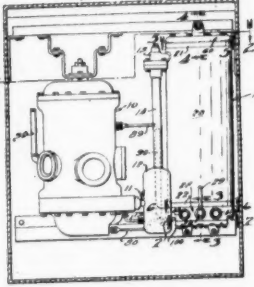
**NATIONAL LOCK COMPANY**  
ROCKFORD, ILLINOIS



# PATENTS

Weeks of Dec. 28 & Jan. 4

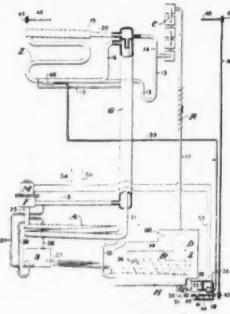
**2,337,624. CONDENSING UNIT.** Charles P. Russell, Dayton, Ohio, assignor to Chrysler Corp., Detroit, Mich., a corporation of Delaware. Application May 4, 1942, Serial No. 441,701. 9 Claims. (Cl. 62-115).



1. A refrigerant condensing unit comprising a compressor including a pressure lubricating system, a water-cooled condenser arranged in refrigerant flow relation with said compressor, said condenser comprising a plurality of water tubes, a shell enclosing said water tubes and a pair of end bells having water passages communicating with the ends of said water tubes, a plurality of externally projecting ridges formed on the outer surface of one of said end bells and integral therewith, said ridges being arranged to form a

continuous, labyrinthine groove, a cover plate engaging the crests of all of said ridges to convert said groove into an enclosed passageway, and connections between the pressure lubricating system of said compressor and the ends of said passageway whereby heat is transferred from the compressor by conduction through said one end bell from lubricant coursing through said passageway to the cooling water coursing through said condenser.

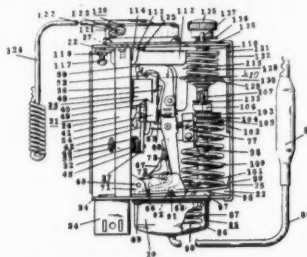
**2,337,870. REFRIGERATION.** Curtis C. Coons, North Canton, Ohio, assignor to the Hoover Co., North Canton, Ohio. Application Oct. 23, 1939, Serial No. 300,696. 16 Claims. (Cl. 62-5).



2. Absorption refrigerating apparatus comprising an inert gas circuit including an evaporator and an absorber, a solution circuit including a boiler and said absorber, means for liquefying refrigerant vapor produced in said generator and for supplying the refrigerant liquid to said evaporator, said boiler comprising a substantially horizontal tubular body, a housing of insulating material about said boiler including a hollow combustion space

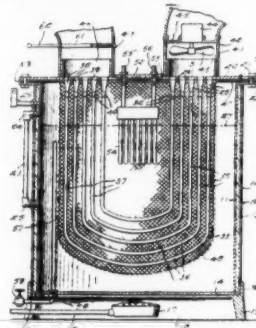
receiving said boiler, an elongated raw gas burner positioned below said boiler, an upstanding radiant positioned centrally of said boiler and between said boiler and said burner, a products of combustion discharge flue opening through said housing into said combustion space, heat transfer fins on said boiler inclined upwardly from the bottom thereof toward said flue, said solution circuit including a liquid heat exchanger coiled about said boiler and embedded in the insulation of said housing.

**2,337,926. CONTROL APPARATUS.** Elton D. Raney, Columbus, Ohio, assignor to Banco Inc., Columbus, Ohio, a corporation of Ohio. Application Oct. 21, 1939, Serial No. 300,611. 4 Claims. (Cl. 62-4).



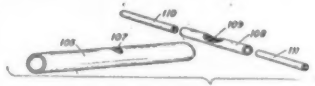
1. In combination with a refrigerating system including an enclosure, an evaporator in the enclosure for affecting the temperature of a medium therein and means for circulating refrigerant through the evaporator; a control mechanism for said means including a member for starting the circulating means when said member is moved to one position and for stopping the circulating means when said member is moved to a second position; a spring constantly biasing the member toward said second position; a thermostatic device for moving said member to the first mentioned position, said device being ineffective for urging said member to said second position and being operable according to changes in temperature of the evaporator for operating said member; and a thermostatic device having a part thereof movable gradually according to gradual changes in temperature of said medium, said part being movable gradually into the path of movement of the movable member toward said second position for yielding resisting movement of the member to said second position.

**2,338,016. HEAT EXCHANGER.** Trifon Vassiliou, East Orange, N. J. Application Nov. 27, 1941, Serial No. 420,711. 5 Claims. (Cl. 183-32).



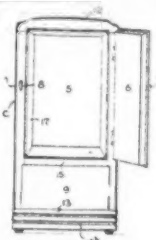
1. An air conditioning unit comprising an open top water container, a covering for said container, means for securing said cover to said container, said cover having a pair of radially opposed series of openings therethrough, funnel-shaped members secured at their larger ends in said openings and depending therefrom, a series of parallel U-tubes in said container, each having its opposite ends split and frictionally engaging in the smaller ends of said funnel-shaped members, a pair of upstanding collar flanges on the upper side of said cover each surrounding one of said series of openings, an inlet pipe secured to one of said flanges, means in said inlet pipe for forcing air through said U-tubes, an outlet pipe secured to the other of said flanges, means in said outlet pipe for filtering air passing therethrough, and heat exchange means for varying the temperature of the water in said container whereby the temperature of said air is varied.

**2,338,090. CONNECTION FOR HEAT EXCHANGE SYSTEMS.** Joseph L. Bradfield, Seattle, Wash., assignor of twenty-five per cent to Paul Wayne Bradfield, Tacoma, Wash. Application April 16, 1941, Serial No. 388,719. 3 Claims. (Cl. 285-106).



1. For use in heat exchange system wherein secondary tubing is connected with primary tubing, a connection comprising: a tubular member having a port in its wall, and a ported conductor member secured to said tubular member transversely thereof with the axis of the tubular member being substantially tangential with the bore of the conductor member, the ports of the two members being positioned for fluid intercommunication from one member to the other member.

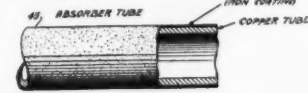
**2,338,194. REFRIGERATOR CABINET CONSTRUCTION.** Robert Winter Hull, Connersville, Ind., assignor to Rex Mfg. Co., Inc., Connersville, Ind., a corporation of Indiana. Application June 24, 1939, Serial No. 281,019. 7 Claims. (Cl. 220-9).



1. In a refrigerator cabinet having an outer sheet metal shell and an inner food compartment liner, said outer shell including side panels having front and rear marginal walls of the cabinet, a bottom pan or insulation support underlying the food compartment liner in spaced relation

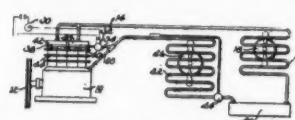
with respect thereto, said bottom pan having side flanges secured to the adjacent side panels of the cabinet, a center rail panel of sheet metal having a horizontal portion secured to said pan and a vertical portion forming the center rail or panel of the cabinet, said bottom pan being notched and said center rail panel having the metal at opposite ends thereof bent upon itself providing looped portions engaging in said notches, the side panels having their marginal edges thereof engaged in said looped portions, the metal beyond said looped portions being extended and fitted against the inner front wall of the side panels and welded thereto.

**2,338,223. REFRIGERATION.** Philip P. Anderson, Jr., Evansville, Ind., assignor to Servel, Inc., New York, N. Y., a corporation of Delaware. Application April 15, 1941, Serial No. 388,568. 13 Claims. (Cl. 62-119).



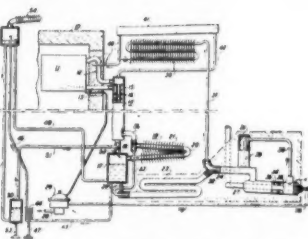
10. Refrigeration apparatus having a wall portion formed by a tube through which heat is transferred from a film of liquid on the outside of said tube to a cooling medium flowing through said tube, said tube comprising a copper pipe having an exterior coating of iron to facilitate formation of said film.

**2,338,240. REFRIGERATING APPARATUS.** Richard E. Gould, Dayton, Ohio, assignor to General Motors Corp., Dayton, Ohio, a corporation of Delaware. Application April 23, 1942, Serial No. 440,122. 10 Claims. (Cl. 62-115).



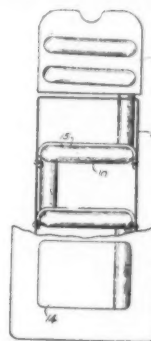
1. Gas conditioning apparatus comprising in combination, an evaporator, a condenser, a multiple cylinder compressor, refrigerant flow connections between said evaporator, condenser and compressor including a suction line leading from said evaporator to said compressor, means for flowing a gas to be conditioned in thermal exchange relationship with said evaporator, means for flowing a cooling medium in thermal exchange with said condenser, said compressor comprising a plurality of outlet valves, means for holding one of said outlet valves open including a valve lifting piston, means for subjecting one end of said piston to a pressure corresponding to the compressor discharge pressure, means for subjecting the other end of said piston to a pressure corresponding to the pressure within suction line, said last named means including a passage leading from said suction line to the one end of said piston, a control valve in said passage, and means responsive to the temperature of said gas for controlling the opening and closing of said control valve, means for substantially equalizing the pressures on opposite sides of said piston, and means for normally biasing said piston into one extreme position when said pressures are substantially equalized.

**2,338,265. REFRIGERATION.** Thomas K. Sherwood, Wellesley Hills, Mass., assignor to Servel, Inc., New York, N. Y., a corporation of Delaware. Application Sept. 6, 1941, Serial No. 409,764. 10 Claims. (Cl. 62-119.5).



5. A vapor producer including a heated vessel, a circulation vessel at an elevation above said heated vessel, a conduit connecting said vessels, a vapor liquid lift for raising liquid into said vapor vessel, a condenser arranged to convert vapor in said upper vessel to liquid, said vaporizer being adapted to be connected to a jet for causing flow of gas in the gas circuit of a diffusion type absorption refrigeration system, and said lift being connected to receive liquid from the absorption liquid circuit of said system.

**2,338,277. EVAPORATOR.** Carl T. Ashby, Evansville, Ind., assignor to Servel, Inc., New York, N. Y., a corporation of Delaware. Application Sept. 20, 1941, Serial No. 411,625. 3 Claims. (Cl. 62-126).



1. An evaporator for refrigeration apparatus comprising an iron conduit coated on the outside with aluminum, and a shelf plate having an aluminum surface attached to said conduit by fusion of said aluminum coating and surface.

**2,338,284. REFRIGERATOR.** William R. Hainsworth, Larchmont, N. Y., assignor, by mesne assignments, to Servel, Inc., a corporation of Delaware. Application July 19, 1932, Serial No. 623,323. Renewed April 17, 1935. 27 Claims. (Cl. 62-89).

1. A refrigerator comprising a cabinet having a thermally insulated storage compartment, a liner of heat conducting material for said compartment, heat conduct-

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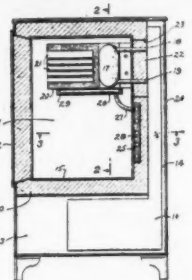
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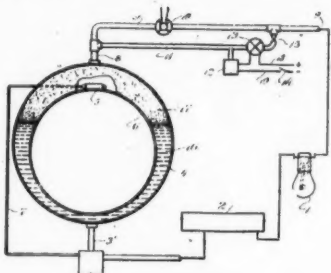
(Concluded from Page 22, Column 4)

ing means including said liner, and refrigeration apparatus including a cooling element adapted to receive ice freezing trays, said refrigeration apparatus being



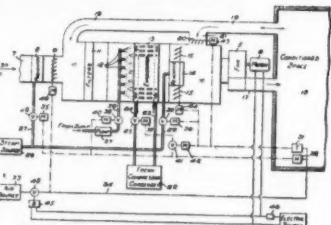
removably assembled as a unit with said cabinet in such a manner that said cooling element extends within said storage compartment and is in thermal exchange relation with said heat conducting means.

**2,338,362. MEANS FOR MAINTAINING OVERRUN IN ICE CREAM AND LIKE PRODUCTS.** James T. Smith and Alexander L. Belter, Chicago, Ill., assignors to Mills Novelty Co., Chicago, Ill., a corporation of Illinois. Application May 31, 1940, Serial No. 338,200. 6 Claims. (Cl. 62-114).



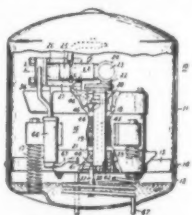
1. In a freezer system, the combination of an ice-cream freezer having a freezer barrel and a refrigerant chamber surrounding the same, means whereby the contents of the freezer barrel may be frozen by action of a refrigerant circulated in the system and cyclically passing through said chamber in contact with said barrel, said means including a thermostatic expansion valve for controlling the flow of refrigerant to said chamber, and means comprising a thermostatic bulb located in contact with the freezer barrel within said chamber, tubing connecting the same with said expansion valve and a thermal fluid within said bulb and tubing for controlling the operation of said valve.

**2,338,362. PSYCHROMETRICALLY CONTROLLED AIR CONDITIONING SYSTEM.** James C. Marlow, Atlanta, Ga., assignor to B. F. Sturtevant Co., Boston, Mass. Application June 23, 1942, Serial No. 448,074. 9 Claims. (Cl. 257-3).



1. An air conditioning system comprising an air heater, an air washer, an air cooling refrigerant evaporator, and including means for moving air to be conditioned through said heater, said washer and said evaporator and for supplying it into the space to be conditioned, a heating fluid source connected to said heater, a water source connected to said washer, a refrigerant source connected to said evaporator, and means including means responsive to changes in the relative humidity in said space for first decreasing the supply of refrigerant from said refrigerant source to said evaporator, for next initiating the supply of water from said water source to said washer, and for next initiating the supply of fluid from said heating source to said heater, upon a fall in relative humidity in said space below the desired level.

**2,338,486. COMPRESSOR UNLOADER.** Harley H. Bixler, Schenectady, N. Y., assignor to General Electric Co., a corporation of New York. Application Oct. 9, 1941, Serial No. 414,293. 7 Claims. (Cl. 230-24).

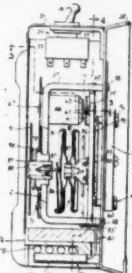


1. In a compressor having a main cylinder bore in which a working fluid is compressed by a piston and an unloader cylinder bore, reciprocable means disposed in said unloader bore, means providing communication between the high compression end of the cylinder bore and one end of the unloader bore at a predetermined position of the reciprocable means, means providing a restricted opening between said one end of the unloader cylinder and the intake side of the compressor means biasing said reciprocable means to the predetermined position, and means responsive to compressor lubricant pressure for causing movement of the reciprocable means to cut off communication between the cylinder bores.

**2,338,563. THERMOSTATIC ELEMENT.** Sven W. E. Anderson, Evansville, Ind., assignor to Servel, Inc., New York, N. Y., a corporation of Delaware. Application Aug. 14, 1941, Serial No. 406,778. 4 Claims. (Cl. 200-140).

1. In combination with a control member to which movement is to be im-

parted, a thermostatic element comprising an expandable and contractible portion, a thermal sensitive portion and a narrow tube connecting said expandable and contractible portion and said thermal sensitive portion, said contractible and expandable portion being operatively associated with the control member and constructed and arranged to produce mechanical energy with changes of temperature to impart movement to the control member, heating means for maintaining said expandable and contractible portion at a higher temperature than said thermal sensitive portion, said thermal sensitive portion being formed of a mate-



rial having high thermal conductivity and a wall thickness in the order of .0085 inch, said thermostatic element being adapted to be located in an enclosure in which the temperature of the air is controlled responsive to the control member, said thermal sensitive portion being closely adjacent to said expandable and contractible portion and normally at a temperature a few degrees above the temperature of air in the enclosure due to heat conduction along said narrow tube, the internal volume of said thermostatic element being as small as practicable having regard to proportioning of said expandable and contractible portion to ensure that adequate mechanical strength will be produced to cause movement to be imparted to the control member, said thermal sensitive portion being more or less freely suspended in the air so that said thermostatic element as a whole responds rapidly to changes in air temperature, said thermostatic element having a limited charge of a volatile fluid sufficient to produce only saturated vapor therein at a predetermined temperature so that the internal pressure developed within said thermostatic element at extremely high temperatures above said predetermined temperature only increases slowly according to the ideal gas law.

## Mooney Discusses Possible Disposal Of Army Surplus

DETROIT—"The American Society of Refrigeration Engineers is obligated to design and produce the best refrigerating equipment possible to insure our armed forces' getting good food in the best of condition," declared Mark E. Mooney, manager of Carrier Corp.'s refrigeration sales, speaking before the January meeting of the Detroit Section, A.S.R.E. at the Rackham Foundation.

The Detroiters also heard Richard Neumann of AIR CONDITIONING & REFRIGERATION NEWS give a first-hand account of jungle fighting against the Japs in New Guinea which ended for Neumann, a machine gun sergeant, when a sniper sent a slug through his right elbow.

Discussing "Portable Refrigeration for the Armed Forces," Mooney stressed the fact that the American soldier usually eats "real food"—meat, vegetables, milk—unlike the Jap who subsists virtually on rice alone, and that this "real food" requires extensive refrigeration.

Using slides, Mooney showed the basic walk-in refrigerator used by the armed forces. The single unit consists of a 12 by 9 ft. box with a capacity of 675 cu. ft., refrigerated by one self-contained cooling unit, Mooney said. The storage unit is constructed of completely interchangeable parts, permitting an increase in size and making for quick repairs should one panel of the box be damaged by the enemy.

In addition to the basic single unit, there are three other standard sizes,

all achieved by adding panels and cooling units. The second size is approximately twice the size of the single storage unit; the third, three times as large; and fourth is a storage unit 93 feet long, six times as large as the single unit and powered by six self-contained cooling units.

Balance of Mooney's talk was devoted to showing slides and discussing various applications and installations in the field of the standard and other types of refrigerated storage boxes, including portable units.

In the discussion which followed Mooney's address, the problem of disposing of surplus stocks of refrigerating equipment after the war brought three suggestions from Mooney.

Surplus units and parts might, Mooney declared, (1) be sold to second-hand dealers, (2) be sold back to the manufacturer for eventual resale, or (3) be sent into the export market or disposed of in this country on a "lend-lease" basis.

Questioned as to the postwar market for portable, self-contained, self-powered storage units similar to those being used by the armed forces, Mooney pointed out the possibilities of interesting the farmer who is located off power lines.

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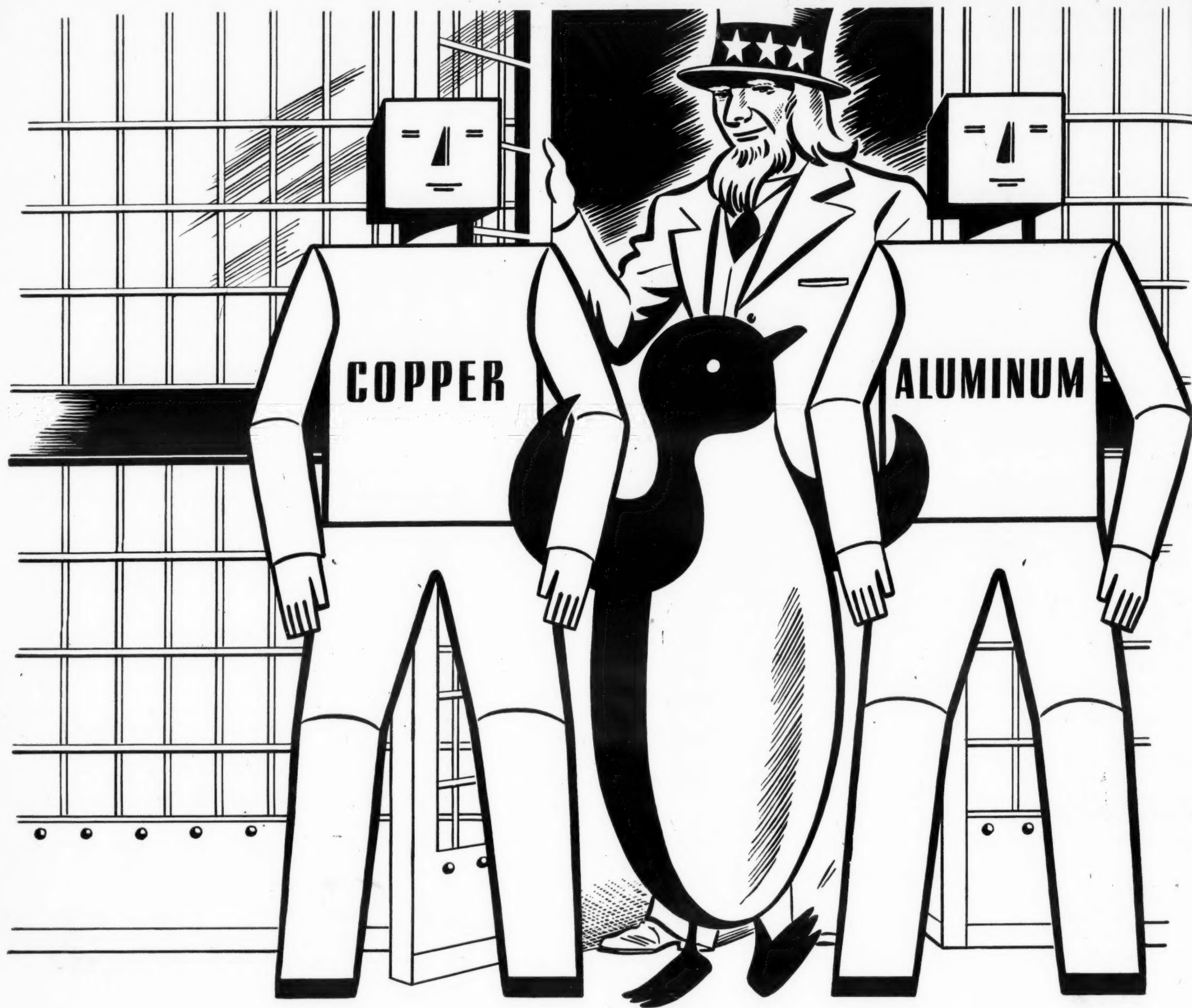
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In the face of the difficulties created by the embargo on these two essential metals we have adhered to Bush standards of quality. But the release is a relief. It will mean still better work done with more speed and facility.

We've been given the green light. Look for more and better products... better service... better performance. Substitutes no longer need suffice. Bush Heat Transfer Products once again make materials and workmanship MATCH.

This means more and better business for you, too. Easier installations... more efficient operation... better satisfied customers. Take advantage of this unexpected opportunity TODAY!

Copper and Aluminum are going into Bush Transfer Products NOW. Write for latest Bulletin to The Bush Manufacturing Company, Hartford, Connecticut... 415 Lexington Avenue, New York... 549 W. Washington Boulevard, Chicago.

PENGUIN PETE



# Bush

HEAT TRANSFER PRODUCTS



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**HEAT TRANSFER PRODUCTS**

**BUSH**

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Douglas Aircraft has learned how to make soft aluminum alloy  
virtually as hard as steel . . . with refrigeration. First placed in a  
solution of nitrate salt at 950° F. . . then plunged into water at 42°  
to 45° . . . the material is stored at 10° F. Once again refrigeration  
is playing its part in assuring the safety of our airmen. One more  
achievement for refrigeration in industry . . . The Bush Manufacturing  
Company, Hartford, Connecticut . . . 415 Lexington Avenue, New  
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**ALUMINUM . . . A NEW FIELD**

